

**WORLD DATA CENTER A**  
**Oceanography**



**CATALOGUE OF DATA**  
**and**  
**REPORT OF DATA EXCHANGE**  
**1998**

**WDCA-OC-99-1**

World Data Centers conduct international exchange of geophysical observations in accordance with the principles set forth by the International Council of Scientific Unions. WDC-A is established in the United States under the auspices of the National Academy of Sciences.

**WORLD DATA CENTER A  
Oceanography**



**CATALOGUE OF DATA  
and  
REPORT OF DATA EXCHANGE  
1998**

**CHANGE NOTICE NOS. 62 AND 63  
(1 JANUARY - 31 DECEMBER 1998)**

**WORLD DATA CENTER A  
Oceanography  
Silver Spring, Maryland**

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**1999**

## ***ABSTRACT***

This publication lists and describes all data received by WDC-A, Oceanography during the period 1 January - 31 December 1998. It supplements the original six-volume Catalogue of Data, which includes Change Notice Nos. 1-16. It also includes tabulations of data received during 1998 as well as summarizations of data received prior to 1998. The types of data include oceanographic station data, bathythermograph data, current measurements, biological observations, meteorological observations, and sea surface measurements. An Alphabetical Index of ship names and a Geographical Index of ocean areas assist the user in selecting the required data.

The Catalogue of Data and Report of Data Exchange, 1998 is the fourth in a new series of publications issued yearly by WDC-A, Oceanography. It combines the data information previously presented in WDC-A's Change Notices to the Catalogue of Data and its annual report Oceanographic Data Exchange; these publications are no longer issued separately by WDC-A.

## ***ACKNOWLEDGEMENT***

Ron Moffatt has announced his intention to retire from the Federal Service on 31 December 1999, after more than 33 years as a staff member of WDC-A, Oceanography.

**Compiled by**

**Charlotte L. Sazama  
Ronald E. Moffatt  
E. Godfrey Trammell, Jr.**

## CONTENTS

	Page
ABSTRACT .....	ii
WORLD DATA CENTER A .....	iv
PREFACE .....	vi
INTRODUCTION .....	1
HOW TO USE THE CHANGE NOTICE TO THE CATALOGUE OF DATA .....	2
DATA EXCHANGE POLICY OF WDC-A, OCEANOGRAPHY .....	4
ACKNOWLEDGEMENT OF DATA SOURCES .....	6
EXPLANATION OF THE ALPHABETICAL AND GEOGRAPHICAL INDEXES .....	7
ALPHABETICAL INDEX .....	8
GEOGRAPHICAL INDEX .....	10
NUMERICAL LIST OF COUNTRIES .....	13
LIST OF DATA CENTER ACRONYMS .....	14
INDEX OF COUNTRIES AND INSTITUTIONS CONTRIBUTING DATA TO WDC-A, OCEANOGRAPHY DURING THE PERIOD 1 JANUARY - 31 DECEMBER 1998 .....	15
EXPLANATION OF WDC-A, OCEANOGRAPHY DATA INFORMATION SHEET .....	17
LISTING OF ACCESSIONED DATA PUBLICATIONS .....	24
INTERNATIONAL DATA ACQUISITION AND EXCHANGE .....	27
WDC-A, OCEANOGRAPHY DATA BASE SUMMARIES .....	30
GODAR ACCESSIONS, 1998 .....	36
NODC ACCESSIONS, 1998 .....	38
DATA HOLDINGS OF RNODC's AND SPECIALIZED DATA CENTERS .....	45

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FEB 25 2000

## ***WORLD DATA CENTER A***

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National Academy of Sciences  
2101 Constitution Avenue, N.W.  
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WDC-A, Glaciology  
Cooperative Institute for Research in  
Environmental Sciences  
Campus Box 449  
University of Colorado  
Boulder, Colorado 80309, U.S.A.

Telephone: (303) 492-5171  
FAX: (303) 492-2468

### PALEOCLIMATOLOGY:

WDC-A, Paleoclimatology  
National Geophysical Data Center  
NOAA, E/GC4  
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Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6160  
FAX: (303) 497-6513

### ROTATION OF THE EARTH

WDC-A, Rotation of the Earth  
Earth Orientation Department  
U.S. Naval Observatory  
Washington, D.C. 20392-5420, U.S.A.

Telephone: (202) 762-1469  
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### OCEANOGRAPHY:

WDC-A, Oceanography  
National Oceanic and Atmospheric  
Administration  
Silver Spring, MD 20910-3282, U.S.A.

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FAX: (301) 713-3303

### METEOROLOGY (AND NUCLEAR RADIATION):

WDC-A, Meteorology  
National Climatic Data Center  
NOAA, E/CC  
Federal Building  
Asheville, NC 28801-5001, U.S.A.

Telephone: (704) 271-4474  
FAX: (704) 271-4246

### ROCKETS AND SATELLITES:

WDC-A, Rockets and Satellites  
National Space Science Data Center  
Goddard Space Flight Center  
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Greenbelt, Maryland 20771, U.S.A.

Telephone: (301) 286-6695  
FAX: (301) 286-1635

SOLID-EARTH GEOPHYSICS  
(TSUNAMIS, GRAVIMETRY, EARTH  
TIDES, RECENT MOVEMENTS OF  
THE EARTH'S CRUST, MAGNETIC  
MEASUREMENTS, PALEOMAGNE-  
TISM AND ARCHEOMAGNETISM,  
VOLCANOLOGY, GEOTHERMICS):

World Data Center A,  
Solid-Earth Geophysics  
NOAA, NGDC, E/GC1  
325 Broadway  
Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6521  
FAX: (303) 497-6513

SOLAR-TERRESTRIAL PHYSICS  
(SOLAR AND INTERPLANETARY  
PHENOMENA, IONOSPHERIC  
PHENOMENA, FLARE-ASSOCIATED  
EVENTS, GEOMAGNETIC VARIATIONS,  
MAGNETOSPHERIC AND INTER-  
PLANETARY MAGNETIC PHENOMENA,  
AURORA, COSMIC RAYS, AIRGLOW):

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NOAA, NGDC, E/GC2  
325 Broadway  
Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6761  
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HUMAN INTERACTIONS IN THE  
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WDC-A, Human Interactions in the  
Environment  
CIESIN  
2250 Pierce Road  
University Center, MI 48710, U.S.A.

Telephone: (517) 797-2727  
FAX: (517) 797-2622

MARINE GEOLOGY AND GEOPHYSICS  
(GRAVITY, MAGNETICS, BATHYMETRY,  
SEISMIC PROFILES, MARINE SEDI-  
MENT AND ROCK ANALYSIS):

World Data Center A,  
Marine Geology and Geophysics  
NOAA, NGDC, E/GC3  
325 Broadway  
Boulder, Colorado 80303, U.S.A.

Telephone: (303) 497-6390  
FAX: (303) 497-6513

ATMOSPHERIC TRACE GASES:

WDC-A, Atmospheric Trace Gases  
Carbon Dioxide Information Analysis  
Center  
Oak Ridge National Laboratory  
Oak Ridge, TN 37831-6335, U.S.A.

Telephone: (423) 241-4842  
FAX: (423) 574-2232

REMOTELY SENSED LAND DATA:

WDC-A, Remotely Sensed Land Data  
U.S. Geological Survey  
EROS Data Center  
Sioux Falls, SD 57198, U.S.A.

Telephone: (605) 594-6142  
FAX: (605) 594-6589

SEISMOLOGY

WDC-A, Seismology  
U.S. Geological Survey  
Denver Federal Center, MS-967  
P. O. Box 25046  
Denver, Colorado 80225, U.S.A.

Telephone: (303) 273-8500  
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## ***PREFACE***

The six-volume Catalogue of Data and the loose-leaf Change Notice Numbers 1-16, which have been integrated into the Catalogue, list all oceanographic data received by World Data Center A, Oceanography, from July 1957 through June 1975. The Catalogue has a loose-leaf arrangement of sheets, which have been punched for standard three-ring binders. It includes station location charts for many cruises.

Beginning with Change Notice No. 17, each Change Notice is printed in a modified format as a separate, bound publication describing all data received during a particular six-month or one-year period. The six-volume Catalogue of Data, including Change Notice Nos. 1-16, continues to serve as a reference volume for data received from July 1957 through June 1975. Provision has been made in the modified format for correlating newly received data for a particular cruise with data previously received for that same cruise and already described in a prior Change Notice. The capability for identifying those data, which have been machine-processed by a national, regional, or responsible national oceanographic data center, has been retained in the modified catalogue format.

Until recently, data gathered before the beginning of the IGY in 1957 had not been extensively accessioned by World Data Center A, Oceanography; however, numerous international bodies have pressed the WDCs, Oceanography to accession as much historical data as possible, in order to augment the data bases required for support of Climate Research and Global Change Programs. Thus, the acquisition of pre-IGY, as well as post-IGY data, has become a high priority goal for WDC-A. The Catalogue now contains pre-IGY data accessioned by WDC-A and available in automated form to requesters in the international oceanographic community. The Global Oceanographic Data Archaeology and Rescue (GODAR) program has generated significant contributions of historical oceanographic observations from numerous countries.

It should be noted that the designations of countries used in this publication do not imply the expression of any opinion whatsoever on the part of this Center concerning the delineation of the territorial boundaries, the political subdivisions, or the legal status of any country or territory. WDC-A, Oceanography, will make every effort to promptly correct any inconsistency that is brought to its attention.

## INTRODUCTION

The World Data Center system was established in 1957 to collect data from the numerous and widespread observational programs of the International Geophysical Year (IGY) under the principles set forth by the International Council of Scientific Unions (ICSU) and to make such data readily accessible for an indefinite period of time to interested scientists and scholars. The system consists of World Data Center A (WDC-A) located in the U.S.A.; WDC-B located in Russia; WDC-C located in Western Europe and Japan; and WDC-D located in the People's Republic of China. WDC-A is established under the auspices of the U.S. National Academy of Sciences, where the Coordination Office is located. WDC-A is divided into thirteen discipline subcenters whose addresses are given on pages iv and v. These centers are located in institutions which, in the opinion of the Academy, can best serve the interests of science because of their data-handling capabilities for the appropriate scientific disciplines. WDC-A, Oceanography, is collocated with the National Oceanographic Data Center (NODC) in Silver Spring, Maryland.

After completion of the IGY program, ICSU delegated the responsibility for the operation of the World Data Centers to its Comite International de Geophysique (CIG) and subsequently to the ICSU Panel on World Data Centres. The framework for continued international exchange of oceanographic data is set forth in ICSU's Guide to the World Data Center System and the Intergovernmental Oceanographic Commission's (IOC's) Manual on International Oceanographic Data Exchange.

The types of oceanographic data desired for inclusion in the World Data Center system are those from international cooperative expeditions, Global Change and Climate Research Programs, and those associated with various countries' National Oceanographic Programs. Data are to be exchanged internationally in accordance with provisions of the IOC's Manual and the ICSU Guide. Lists of National Oceanographic Programs are compiled by various national committees on oceanography and submitted to the Intergovernmental Oceanographic Commission for dissemination to the international oceanographic community.

Contributors of oceanographic data to the World Data Center system and national committees on oceanography are urged to compare the Catalogue of Data with data gathering cruises and expeditions listed in IOC information documents or on-line information systems to determine whether the cruises actually completed agree with those listed and to ensure that the data resulting from them are transmitted to the World Data Centers in the manner prescribed by the IOC Manual and the ICSU Guide. Data need not be limited to those identified in IOC documents or on-line systems; WDC-A, Oceanography, welcomes all data that fall within the framework of the ICSU Guide and the IOC Manual and that contributors may wish to include in the international marine data base of the WDCs.

## **HOW TO USE THE CHANGE NOTICE TO THE CATALOGUE OF DATA**

### **Catalogue Numbering System**

The catalogue numbering system uses groups of numbers and letters to designate identifying references for purposes of data archiving and retrieval. A catalogue number consists of numerals for the assigned: series, country, institution, ship and cruise.

**Series** — The catalogue numbering system is divided into basic groups called series. At present, these consist of the 100 series for data from ships and other mobile platforms and the 200 series for data from shore and fixed stations in the following categories:

- a. Coastal and island stations.
- b. Near shore manned stations; i.e., lightvessels and platforms.
- c. Offshore manned stations; i.e., ocean weather ships.
- d. Unmanned stations; i.e., automatic buoys.
- e. Stations on shipping routes.
- f. Offshore reference stations visited regularly.
- g. Cables in use for oceanographic observations.
- h. Repetitive drifting observations; i.e., ice islands, drifting buoys.

**Country** — A list in the Indexes section includes all countries and institutions from which this Center has received data during this period together with their discrete identifying numbers. The series and two-digit country number comprise the first three digits of the catalogue number.

**Example:** For country number 01, Argentina, data from ships and mobile platforms are catalogued as 101, and data from shore and fixed stations as 201.

**NOTE:** The designations of countries used in this publication do not imply the expression of any opinion whatsoever on the part of this Center concerning the delineation of the territorial boundaries, the political subdivisions, or the legal status of any country or territory.

**Institution** — An institution which contributed data, either directly or through its designated national agency or national, regional or specialized oceanographic data center, is assigned a decimal number following the series/country number.

**Example:** The number 101.01 is assigned to data taken by ships and mobile platforms and received from the Argentine Servicio de Hidrografía Naval, and the number 201.01 is assigned to data taken at shore and fixed stations and received from the same institution.

Ship — Each ship, or in some instances a group of ships operating together, is assigned a letter following the series/country/institution number. The letter is followed by a number assigned to the particular cruise as the data are received.

NOTE: The term "cruise" is used in this catalogue to define, whenever possible, the beginning and ending dates of a series of data collected by a ship, usually identified by the contributing institution with a cruise name and/or number. Sometimes it is necessary to group several series of data from one or more ships together under one catalogue number.

Example: The first cruise data received from the Argentine Servicio de Hidrografia Naval are from the ship CAPITAN CANEPA, which is assigned the letter A, followed by the number 01, thus A-01; the second cruise is A-02, the third A-03, etc. Thus, the catalogue numbers 101.01 A-01, A-02, A-03, etc.

A similar system is used in the 200-series for ships but is not applied to lightvessels and fixed shore stations; for the latter the ship/cruise identifier is omitted. For these categories, the series/country/institution numbers are given, but the lightvessel's or station's name must be added instead of the ship/cruise number to complete the catalogue identification.

Example: The Canadian station at Triple Island is identified as: 206.03 Triple Island.

A shore station is listed under the country in or near whose territory it is located. If observations are carried out and the data contributed by an institution of another country, the observing country's name and institution are listed after the name of the country of location.

### How to Use the Alphabetical Index

1. Look up the name of the ship or fixed station in the Alphabetical Index where the related country/institution/ship catalogue numbers are listed.
2. Look up, under the respective countries, the indicated Catalogue Numbers.

### How to Use the Geographical Index

1. Obtain the geographic area number and name from the Geographical Index Charts.
2. Look up the list of catalogue numbers of available data for the area in the

## Geographical Index.

3. Use these catalogue numbers to locate information about the types and amount of data available.

### How to Obtain Data from WDC-A, Oceanography

When communicating with the Center for additional information concerning data, the requester should, where possible, refer to the specific catalogue numbers for data of interest. The catalogue numbers are designed to facilitate the identification and retrieval of the information or data you need.

Address all correspondence to:

Director, World Data Center A, Oceanography  
National Oceanic and Atmospheric Administration  
Silver Spring, MD 20910-3282 U.S.A.

If you telephone, the numbers are:

The Director: 301-713-3290.  
The Associate Director: 301-713-3295.  
The Data Archives: 301-713-3295.  
FAX: 301-713-3303  
E-mail: wdca@nodc.noaa.gov

If you wish to visit the Center, its office hours are from 6:30 a.m. to 3:30 p.m., Monday through Friday. The Center is not open on Saturdays, Sundays, and U.S. national holidays. If you wish the use of study space, you should, if possible, give the Center advance notice so that necessary arrangements can be made. There is no charge for the use of study space.

### Data Exchange Policy of World Data Center A, Oceanography

World Data Centers are held responsible for the provision of data and information to qualified requesters in the scientific community either in exchange or at a cost not to exceed that of processing and shipping. Unless a requester specifies otherwise, the Center is responsible for using the method which most satisfactorily reproduces the data or information item at the least cost. For certain types of requests, limitations in funding, personnel, or facilities may preclude direct or free provision of data or information by the World Data Center.

Data exchanges between WDC-A, Oceanography and WDC's in the same discipline usually take place without charge for routine exchanges of mutually agreed-upon types of data received by WDC-A in internationally-approved data

exchange formats and in readily reproducible media forms. Non-standard data types are not normally exchanged. The ICSU Panel has now recognized that it is not always economically feasible to copy large data sets from one WDC to another. For certain types of data, the exchange of inventories of available data in a WDC subcenter may be considered acceptable in lieu of the transfer of the actual data sets.

In general, reasonably-sized requests from national or regional contributors to WDC-A, Oceanography may be considered as exchange, and equivalent data thus provided to the requester without charge. For requests for unusually large amounts of data, for specially formatted data, for derived data products, or for data to be obtained from outside the WDC system, WDC-A will normally be required to recover the costs of processing and shipping, or, at its discretion, may arrange for the request to be serviced by an RNODC or a regional, national, or disciplinary center. WDC-A may serve as an intermediary or coordinator for requests for unique types of data or data in other disciplines by placing the originator of the request in contact with the appropriate institution or disciplinary center.

Normally, WDC-A, Oceanography considers its data exchange commitment with a cooperating Data Center to be limited to the servicing of those requests or routine updating requirements intended to build or enhance standard data bases operated by that Center for specific, mutually agreed-upon data types and geographical areas of national or scientific interest. If the availability of funding and resources permit, WDC-A also attempts to assist such cooperating Data Centers when they require special data sets for institutions that are performing project-related research for international climate and global change programs and/or that have historically contributed data to WDC-A, Oceanography through that Data Center. WDC-A, Oceanography is obliged, in any case, to follow the exchange and cost recovery policies of its sponsoring (funding) government agency, while attempting to maintain consistency with data exchange guidelines of the ICSU Panel on WDC's as published in the ICSU Guide.

Data and information may be requested from WDC-A, Oceanography through NODCs, Designated National Agencies, or any other organization identified by national or international initiatives as responsible for communication with the World Data Centers. These materials may also be requested directly from WDC-A, Oceanography. Organizations, institutions, or individuals from Member States of the IOC may apply to the IOC Secretariat or UNESCO for possible assistance in funding their projects.

Data Centers or institutions in the international community that have acquired an automated data set or specialized data product from WDC-A must be aware that original data sets are updated from time to time, errors corrected, or spurious data deleted by the originating data center. Where duplicate data sets

are deliberately held in this way, the holder is responsible for making regular contact, as required, with the originating center to check whether the old data set is still valid, whether it should be deleted, or whether new data are available. WDC-A bears no responsibility in the conduct of these arrangements, except as regards the provision of information in its role as a coordination and referral center.

#### Acknowledgment of Data Sources

In many instances, data contributed to the Center are unpublished at the time of receipt. Unpublished data are identified in the Change Notice by the absence of a publication number in the column entitled Data Center Reference Number. Accordingly, as stipulated by the Guide, recipients of copies of such data from the Center are reminded that the rights of the original investigators must always be respected. Thus, it is requested that *if any data supplied by WDC-A, Oceanography are published, due acknowledgment be made of the institution (and where appropriate, the principal investigator) which undertook the original observations.* To facilitate proper acknowledgment, the Change Notice indicates the originating institution.

PART I  
CATALOGUE INDEXES



## ***EXPLANATION OF THE ALPHABETICAL INDEX OF SHIPS AND FIXED STATIONS***

This index presents in alphabetical order the names of the ships, lightvessels, platforms, and shore stations that are listed on the Data Information sheets.

***Ship or Fixed Station*** — The name of the ship, lightvessel, platform, light-house, shore station, etc. Names of ships and lightvessels are given in capital letters, with lightvessels identified by (LV) after their name. All others not so identified are shore or other types of fixed stations.

***Country*** — The name of the country that used the ship to collect data, or the name of the country in or near whose territory fixed oceanographic station observations were made. If the data were collected by an institution of another country, the contributing country is listed after the one where the observations were taken.

***Catalogue Number*** — The country and institution numbers and ship letter assigned to each ship are given in this column to facilitate locating data information in the catalogue.

## ***EXPLANATION OF THE GEOGRAPHICAL INDEX***

The Geographical Index is based on the divisions of areas shown on the three charts immediately preceding the Index. These divisions are defined in "Limits of Oceans and Seas," Special Publication No. 23 of the International Hydrographic Bureau, third edition, Monaco, 1953. To define the extensive areas of the Atlantic, Indian, and Pacific Oceans more specifically, the following subdivisions have been added:

23 - <u>North Atlantic Ocean</u>	32 - <u>South Atlantic Ocean</u>
23a - Northeast Atlantic	32a - Southeast Atlantic
23b - Northwest Atlantic	32b - Southwest Atlantic
45 - <u>Indian Ocean</u>	57 - <u>North Pacific Ocean</u>
45a - Northwest Indian	57a - Northwest Pacific
45b - Northeast Indian	57b - Northeast Pacific
45c - Southwest Indian	61 - <u>South Pacific Ocean</u>
45d - Southeast Indian	61a - Southwest Pacific
SO - <u>Southern Oceans</u>	61b - Southeast Pacific
South of latitude 50° South	

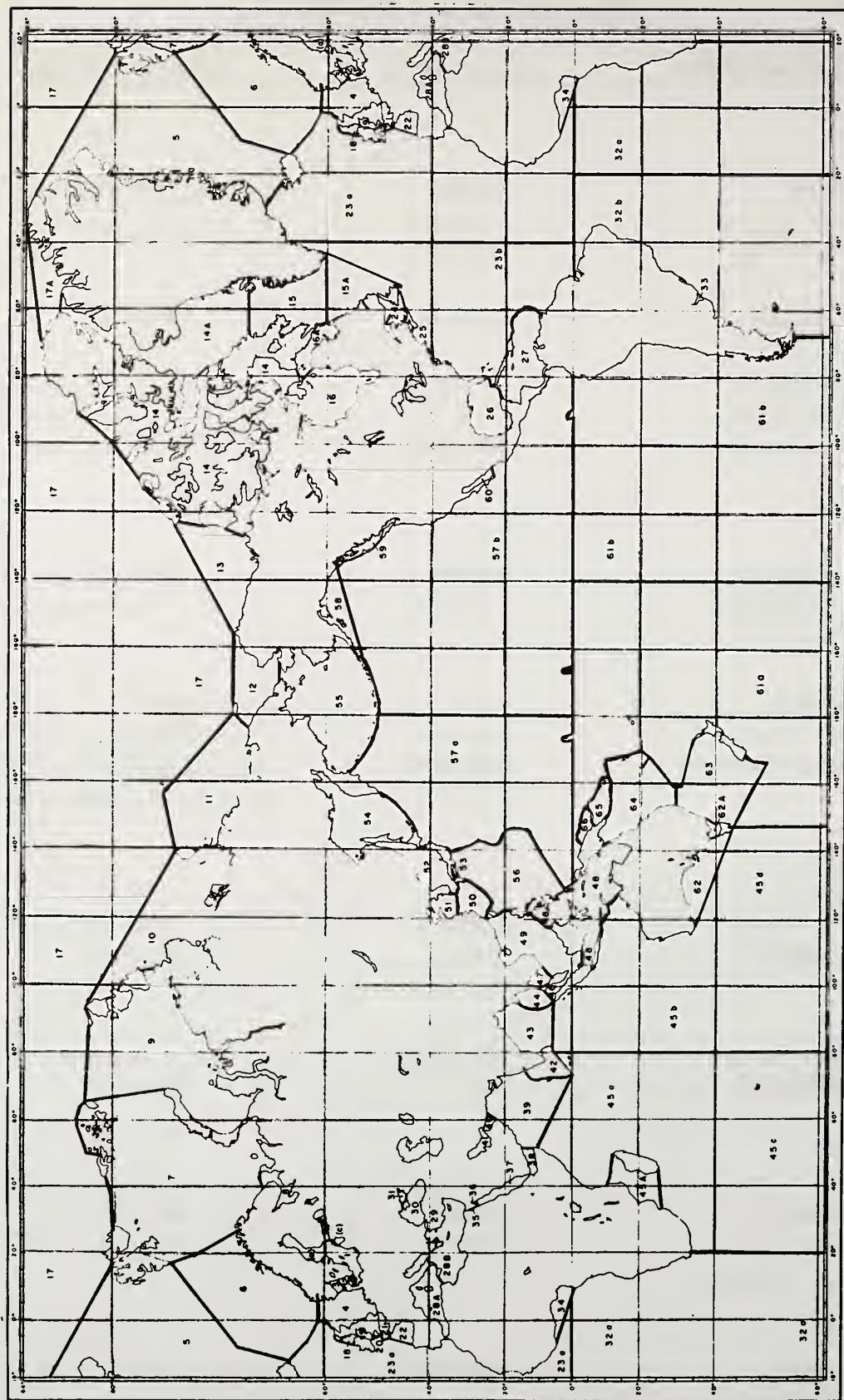
The catalogue numbers of ship cruises extending into any of the areas, or shore or fixed stations located in the areas, are listed under the area's number and name.

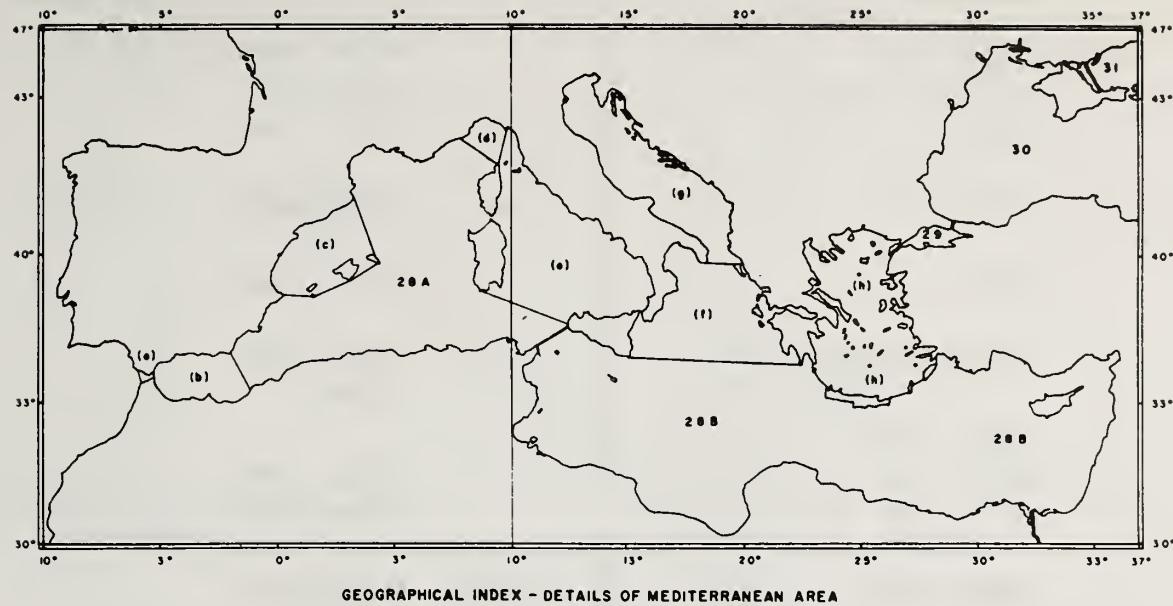
## ALPHABETICAL INDEX

Ship or Fixed Station	Country	Catalogue Number
- A -		
AKADEMICIAN ALEXANDER NESMEYANOV	RUSSIA	137.01 Q
Aircraft	CANADA	106.22 O
- B -		
BUSAN 851	KOREA	143.02 FF
BUSAN 851	KOREA	243.01 C
BUSAN 851	KOREA	143.02 GG
- C -		
CHONNAM 881	KOREA	143.02 GG
CHONNAM 881	KOREA	243.01 C
- D -		
DAVID STARR JORDAN	U.S.A.	139.23 Y
DEUTSCHE BUCHT (LV)	GERMANY	214.01
Darsser Schwelle (platform)	GERMANY	214.01
- E -		
ELBE (LV)	GERMANY	214.01
- F -		
FEHMARNBELT (LV)	GERMANY	214.01
- G -		
GYUNGBUG 885	KOREA	143.02 DD 143.02 GG 243.01 C 243.01 F
- H -		
HOKUSEI MARU	JAPAN	124.02 C

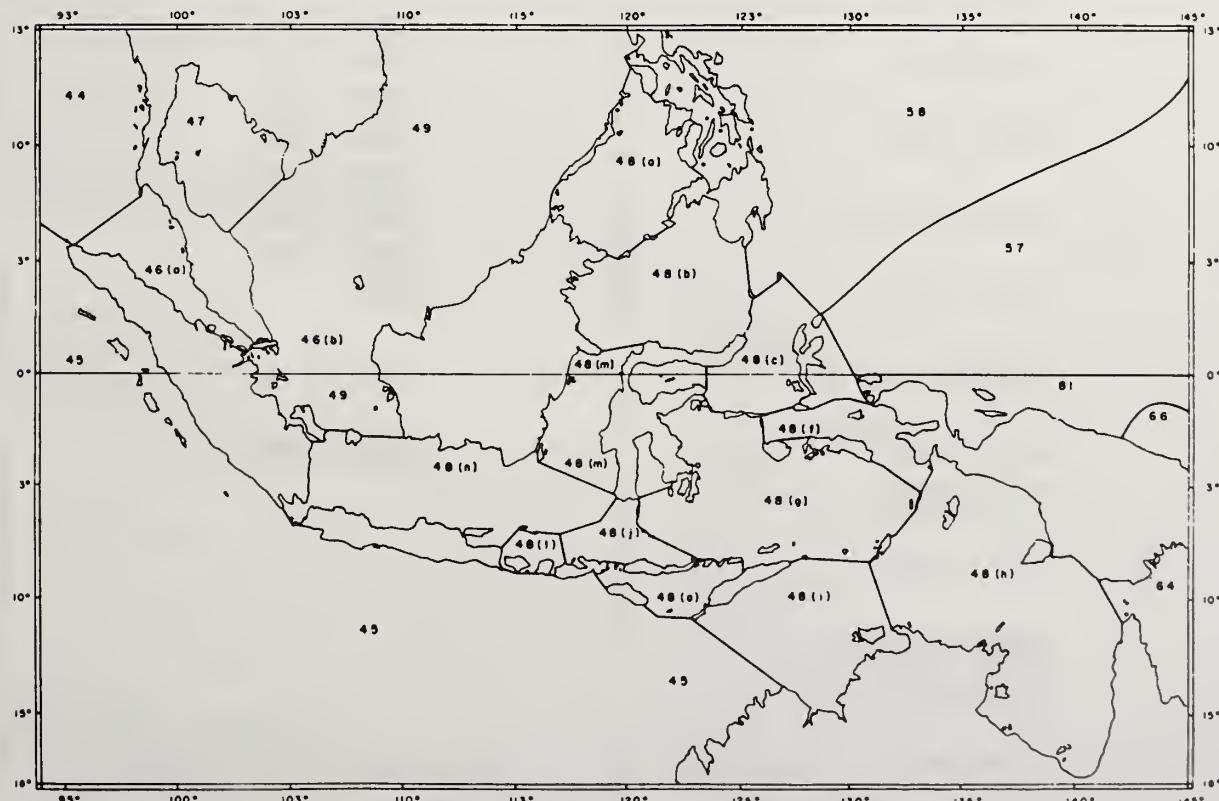
## ALPHABETICAL INDEX

Ship or Fixed Station	Country	Catalogue Number
- I -		
INCHEON 888	KOREA	143.02 FF
- J -		
JOHN P. TULLEY	CANADA	106.22 U
- K -		
Kiel (LH)	GERMANY	214.01
- L -		
LANCE	JAPAN	124.31 C
- N -		
NEW HORIZON	U.S.A.	139.08 V
Neah Bay	U.S.A.	239.02
Nordseeboje II (platform)	GERMANY	214.01
- O -		
ORIGO	JAPAN	124.31 D
OSHORO MARU	JAPAN	124.02 B
- R -		
ROGER REVELLE	U.S.A.	139.08 Y
- S -		
SEIFU MARU	JAPAN	124.11 D
Ship not identified	JAPAN	124.31 E
- T -		
TW/EMS (LV)	GERMANY	214.01





**GEOGRAPHICAL INDEX - DETAILS OF MEDITERRANEAN AREA**



GEOGRAPHICAL INDEX - DETAILS OF INDONESIA AREA

## GEOGRAPHICAL INDEX

<p>1. BALTIC SEA 214.01</p> <p>4. NORTH SEA 214.01</p> <p>5. GREENLAND SEA 124.31 C-01 124.31 D-01 124.31 E-01</p> <p>7. BARENTS SEA 124.31 D-01</p> <p>8. WHITE SEA 106.22 U-03</p> <p>13. BEAUFORT SEA 106.22 O-05</p> <p>50. EASTERN CHINA SEA 243.01 C-27 143.02 FF-02</p> <p>51. YELLOW SEA 143.02 FF-02 243.01 C-27</p> <p>52. JAPAN SEA 124.11 D-76 143.02 DD-04</p>	<p>143.02 GG-02 243.01 C-27 243.01 F-05</p> <p>55. BERING SEA 124.02 B-68</p> <p>57a. NORTH WEST PACIFIC 124.02 B-68 124.02 C-21</p> <p>57b. NORTH EAST PACIFIC 124.02 B-68 124.02 C-21 137.01 Q-02 139.08 V-24 139.08 V-25 139.08 Y-01 139.23 Y-38 239.02</p> <p>58. GULF OF ALASKA 124.02 B-68</p>
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## ***NUMERICAL LIST OF COUNTRIES \****

1. ARGENTINA	44. IVORY COAST
2. AUSTRALIA	45. NIGERIA
3. BELGIUM	46. CONGO (People's Republic)
4. BRAZIL	47. MALAYSIA
5. BURMA	48. MALAGASY REPUBLIC
6. CANADA	49. MOROCCO
7. CHILE	50. SENEGAL
8. COLOMBIA	51. THAILAND
9. DENMARK	52. TURKEY
10. ECUADOR	53. VENEZUELA
11. FINLAND	54. EL SALVADOR
12. TAIWAN	55. COSTA RICA
13. FRANCE	56. PANAMA
14. GERMANY	57. HONDURAS
15. GERMANY	58. DOMINICAN REPUBLIC
16. GHANA	59. HAITI
17. GUATEMALA	60. CUBA
18. ICELAND	61. JAMAICA
19. INDIA	62. AUSTRIA
20. INDONESIA	63. ROMANIA
21. IRELAND	64. EGYPT
22. ISRAEL	65. LEBANON
23. ITALY	66. ALGERIA
24. JAPAN	67. MONACO
25. MEXICO	68. GREECE
26. NETHERLANDS	69. TANZANIA
27. NEW ZEALAND	70. SIERRA LEONE
28. NORWAY	71. TUNISIA
29. PAKISTAN	72. TRINIDAD AND TOBAGO
30. PERU	73. PEOPLE'S REPUBLIC OF CHINA
31. PHILIPPINES	74. CZECHOSLOVAKIA
32. POLAND	75. MAURITANIA
33. PORTUGAL	76. BULGARIA
34. SPAIN	77. BENIN
35. SWEDEN	78. PEOPLE'S DEMOCRATIC REPUBLIC OF YEMEN
36. SOUTH AFRICA	79. IRAQ
37. RUSSIA	80. LIBERIA
38. UNITED KINGDOM	81. SINGAPORE
39. UNITED STATES OF AMERICA	82. UKRAINE
40. URUGUAY	83. REPUBLIC OF YEMEN
42. YUGOSLAVIA	
43. KOREA (Republic of)	

\* May refer to country designations during period data were received.

## ***LIST OF DATA CENTER ACRONYMS***

AODC	Australian Oceanographic Data Centre
BODC	British Oceanographic Data Centre, United Kingdom
CEADO	Centro Argentino de Datos Oceanograficos
CECOLDO	Centro Colombiano de Datos Oceanograficos
CEDO	Centro Espanol de Datos Oceanograficos
CENADO	Centro Nacional de Datos Oceanograficos, Mexico
CENDOC	Centro Nacional de Datos Oceanograficos de Chile
CNODC	China National Oceanographic Data Center
CNRDO	Centro Nazionale Raccolta Dati Oceanografici, Italy
DOD	Deutsches Ozeanographisches Datenzentrum
ENODC	Egyptian National Oceanographic Data Center
ICES	International Council for the Exploration of the Sea
IHO	International Hydrographic Organization
INODC	Indian National Oceanographic Data Center
ISMARE	Irish Marine Data Centre
JODC	Japan Oceanographic Data Center
KODC	Korean Oceanographic Data Center
MARIS	Marine Information Service, Netherlands
MEDS	Marine Environmental Data Service, Canada
NOD	Norsk Oseanografisk Datasenter
NODC	National Oceanographic Data Center, U.S.A.
PSMSL	Permanent Service for Mean Sea Level
SADCO	South African Data Centre for Oceanography
SISMER	Systeme d'Informations Scientifiques pour la Mer

## INSTITUTION INDEX

Country	Institution	Catalogue Number	
06 CANADA	Department of Fisheries & Oceans Institute of Ocean Sciences .....	106.22	
14 GERMANY	Bundesamt fur Seeschiffahrt und Hydrographie .....		214.01
24 JAPAN	Hokkaido University .....	124.02	
	Maizuru Marine Observatory .....	124.11	
	National Institute of Polar Research ...	124.31	
37 RUSSIA		137.01	
39 UNITED STATES	Scripps Institution of Oceanography ...	139.08	239.02
	National Oceanic & Atmospheric Administration .....	139.23	
43 KOREA	National Fisheries Research & Development Agency .....	143.02	243.01



**PART II**

**WDC-A, OCEANOGRAPHY**

**DATA INFORMATION**



## ***EXPLANATION OF THE WDC-A, OCEANOGRAPHY DATA INFORMATION SHEET***

The Change Notice lists on Data Information sheets the data which have been received by this Center. The entries are described below. Countries are arranged in the sequence shown in the numerical list of countries. Data from each country are arranged in the sequence of catalogue numbers. The 200-series data sheets follow the last 100-series data sheet in the catalogue.

Country/Catalogue Number — The series number and two digit number of the contributing country, as well as the identifying number for the data information, are given in this column. Details of the catalogue numbering system are given in the section "How to Use the Change Notice to the Catalogue of Data". The numbers corresponding to the country and institution portions of the Catalogue Number are found in the index section that lists countries and contributing institutions.

Country/Ship or Fixed Station — The country name, as well as the names of ships are printed in capital letters; lightvessels are identified by (LV) following the name. All other names not so designated are those of shore stations and other types of fixed platforms, such as lighthouses (LH) or offshore towers; names are reported as they appear with the data.

Start Date/End Date — The dates during which the data were gathered are given in the order of day/month/year. In some instances, depending on the nature of the project, the dates indicate the beginning and ending of a cruise or expedition, while in others the dates indicate the first and last observations. For shore and fixed stations months and years only are usually given.

Region — The region(s) of the World Ocean where observations were gathered. The areas listed are defined in "Limits of Oceans and Seas," International Hydrographic Bureau, Special Publication No. 23, third edition, Monaco, 1953, with certain modifications as indicated in the Catalogue Indexes section.

### *Oceanographic Serial Stations:*

Number of Stations — The number of oceanographic serial stations (also referred to as hydrographic, hydrographical, hydrological and hydrochemical stations by various authorities) at which serial measurements of temperature, salinity, and other chemical values are made, normally to depths of five meters or greater. Data to depths less than five meters are usually catalogued as Surface Observations. The single dagger symbol (†) is used to denote data obtained by electronic, in-situ, Salinity/Temperature/Depth (STD) or Conductivity/Temperature/ Depth (CTD) sensors.

Physical and Chemical Data — All stations as a minimum have readings of both temperature and salinity, unless otherwise noted. The types of physical and chemical data, available at serial depths as observed values, are listed using the following symbols and abbreviations:

Oxy - Dissolved oxygen content  
Nutr - Nitrogen, Phosphorous, or Silicon compounds  
Pol - Heavy Metals, Hydrocarbons or other pollutants

BT's — The type and number of mechanical bathythermograph (MBT) or expendable bathythermograph (XBT) observations are indicated by:

MB - Analog prints of bathythermographs taken by a mechanical BT  
MTb - Tables or listings of mechanical BT temperature readings at selected depths  
XB - Analog prints of bathythermographs taken by an expendable BT  
XTb - Tables or listings of expendable BT temperature readings at selected depths  
DTb - Table or listings of digital BT temperature readings at selected depths  
STb - Tables or listings of bathythermographs reported at selected levels only, eg. 5m. intervals

Currents — The types and quantity of observations of surface and subsurface currents are indicated by:

Surf - Surface  
Subs - Subsurface

Biological — The types of marine biological observations made and the number of stations and/or abundance of data are indicated by any of the following categories:

Phyt - Phytoplankton	Pleu - Pleuston
Pigm - Pigments	Sest - Seston
PrPr - Primary productivity	Neus - Neuston
Zoo - Zooplankton	Bent - Benthos
Nek - Nekton	PeF - Pelagic fishes
Eggs - Fish eggs and/or larvae	DeF - Demersal fishes
Micr - Microbiological data	FObs - Fishery observations
Biol - Bioluminescence	Bore - Borers and foulers
Poll - Pollution studies	Cet - Cetacea
C14 - Carbon	

**Surf** - Surface visual observations of birds, fishes  
mammals, reptiles or discolored water

**Meteorological** — The presence of meteorological observations taken in conjunction with oceanographic data is indicated. These observations may include wind direction and speed, weather, temperature of the air, dry bulb or wet bulb, atmospheric pressure, clouds, visibility, humidity, dew point, precipitation, solar radiation, or radiosonde observations.

**Sea Surface** — The types of sea surface observations and measurements taken are listed. In addition to the abbreviations and symbols listed for Physical and Chemical Data, the following are also used:

T - Temperature of the water sample  
S - Salinity  
Col - Color of the water  
Tra - Transparency of the water  
Wa - Visual data on waves, including sea state  
IWa - Instrumented wave data  
Ice - Data on ice in the sea  
LP - Light penetration  
LPW - Long period wave records

**Data Center Reference Number** — Data which have been processed at a national, regional, or responsible oceanographic data center, usually have been assigned some type of identifying reference number by that center. The availability of data in automated form is indicated by the initials of the data center followed by that center's reference number. For example, machine-processed oceanographic station data for Reference Number 310863 of the National Oceanographic Data Center would appear as NODC 310863.

Publication number refers to the number from the WDC-A, Oceanography "Listing of Accessioned Data Publications" identifying the published report in which the referenced data appear. The absence of a number in this column indicates that the data were not received in published or processed form.

**Remarks** — Any additional information included to further describe the data. The term "(CAT. OF DATA)" or "(Change)", indicates that data for this listed cruise represent an addition to data previously received by WDC-A, Oceanography, and already described under this Catalogue Number in the Catalogue of Data (including Change Notice Nos. 1-16) or the referenced Change Notice. An asterisk (\*) is placed beside each data entry which represents an addition to data catalogued previously; the total number of observations held for this cruise is shown in parentheses () beneath the data entry. Data entries preceded by a minus sign (-) and enclosed in parentheses, e.g. (-9), indicate a deletion of observations.

## WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	DATE		IBH REGION	NO. OF STAS.	PARA- METERS	BTs	TYPES OF OBSERVATIONS			SEA SURFACE	PUBLICATION NUMBER / DATA CENTER NUMBER	REMARKS
		START	END					CURRENTS	BIOLOGY	MET.			
106.....	CANADA.....												
106.22 O-05	Aircraft	17/04/1992	12/05/1992	13		Oxy *					06.17-185 *		microfiche
106.22 U-03	JOHN P. TULLEY	06/09/1994	11/10/1994	8		Oxy, Nutr					06.17-187		WOCE Section P15N
124.....	JAPAN.....												
124.02 B-68	OSHORO MARU	01/11/1996	06/11/1997	55, 57a, 57b, 58	235	† Nutr			Phyt-227 Zoo-19 FObs-30	X	Wa, Col, Tra	24.04-054	Cruises 72, 73, 75, 76, 78, 79
124.02 C-21	HOKUSEI MARU	21/01/1997	06/10/1997	57a, 57b	186	†	XTb-7		Phyt-97 FObs-49	X	Wa, Col, Tra	24.04-054	Cruises 73 thru 76
124.11 D-76	SEIFU MARU	15/01/1997	28/12/1997	52	417	† Oxy, Nutr	XTb-61		Subs-505	Phyt-45 Zoo-44 Pigm-97	S	24.25-022 thru 24.25-026	Cruises 9501, 9502, 9504, 9506, 9510, 9511
124.31 C-01	R/V LANCE	22/08/1992	29/08/1993	5				XTb-149				22/8.1/9/92 and 17.2/9/8/9	
124.31 D-01	M/S POLARSTAR, M/S ORIGO	16/07/1993	13/08/1993	5, 7	58	†	XTb-60					24.22-051	
124.31 E-01	Ship not identified	10/09/1991	18/06/1993	5	70	†						24.22-051	
137.....	RUSSIA.....												
137.01 Q-02	AKADEMICIAN ALEXANDRE NESMEYANOV	30/08/1993	21/09/1993	57b	38	Oxy, Nutr		Surf - 3			06.17-186		WOCE Section P1W
139.....	U.S.A.....												
139.08 V-24	NEW HORIZON	02/04/1997	19/04/1997	57b	65	† Oxy, Nutr			Zoo-62 Pigm-14 PrP-79			39.01-344	CalCOFI Cruise 9704
139.08 V-25..	NEW HORIZON	07/08/1996	22/08/1996	57b	66	Oxy, Nutr			Zoo-66 Pigm-66 PrP-14	X	Wa, Col, Tra	39.01-345	CalCOFI Cruise 9608

\* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.

† DENOTES DATA OBTAINED BY ELECTRONIC, IN-SITU, CONDUCTIVITY/SALINITY/TEMPERATURE/DEPTH (CTD/STD) SENSORS.

†† ALL STATIONS AS A MINIMUM HAVE READINGS OF BOTH TEMPERATURE AND SALINITY, UNLESS OTHERWISE NOTED.

## WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	TYPES OF OBSERVATIONS						PUBLICATION NUMBER / DATA CENTER NUMBER	REMARKS			
		DATE START	DATE END	IHB REGION	NO. OF STAS.	PARA-METERS	BTs	CURRENTS	BIOLOGY			
139.08 Y-01	ROGER REVELLE	10/10/1996	01/11/1996	57b	86	Oxy, Nutr	††		Zoo-65 Pigm-86 PrPr-16	X Wa, Col, Tra	39.01-345	CalCOFI Cruise 9610
139.23 Y-38	DAVID STARR JORDAN	29/01/1997	14/02/1997	57b	71	Oxy, Nutr			Zoo-71 Pigm-88 PrPr-17 Surf		39.01-344	CalCOFI Cruise 9702
143.....	KOREA.....											Standard Section
143.02 DD-04	GYUNGBUG 885	05/02/1997	24/12/1997	52	434	Oxy, Nutr			Zoo-204	X Wa, Col, Tra	43.02-091	
143.02 FF-02	INCHEON 888, BUSAN 851	13/02/1997	13/12/1997	50, 51	372	Oxy, Nutr			Zoo-206	X 53 - (T, S, Oxy) Wa, Col, Tra	43.02-091	Standard Section
143.02 GG-02	CHONNAM 881, BUSAN 851, GYUNGBUG 885	13/02/1997	16/12/1997	52	288	Oxy, Nutr			Zoo-138	X Wa, Col, Tra	43.02-091	Standard Section
214.....	GERMANY.....											
214.01	DEUTSCHE BUCHT (LV), ELBE (LV), TW/EMS (LV) Nordseeboje II (platform) Kiel (LH), FEHMARNBELT (LV), Darsser Schwelle (platform)	01/01/1994	31/12/1994	1, 4	2,279 *(19,301)					X	14.02-250	
239.....	UNITED STATES.....											
239.02	Neah Bay, etc.	01/08/1995	31/12/1996	57b						T,S		

\* Change period to:  
01/08/1916-31/12/1997  
NOTE: Not all years  
available for all stations.

• DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.

† DENOTES DATA OBTAINED BY ELECTRONIC, IN-SITU, CONDUCTIVITY/SALINITY/TEMPERATURE/DEPTH (CTD/STD) SENSORS.

†† ALL STATIONS AS A MINIMUM HAVE READINGS OF BOTH TEMPERATURE AND SALINITY, UNLESS OTHERWISE NOTED.

## WDC-A, OCEANOGRAPHY DATA INFORMATION

CATALOGUE NO.	SHIP/FIXED STATION	DATE		IHB REGION	NO. OF STAS.	TYPES OF OBSERVATIONS				SEA SURFACE	PUBLICATION NUMBER / DATA CENTER NUMBER	REMARKS
		START	END			PARA- METERS	BTs	CURRENTS	BIOLOGY			
243.....	KOREA.....											
243.01 C-27	BUSAN 851, CHONNAM 881, GYUNGBUG 885	14/02/1997	16/12/1997	50, 51, 52	72	Oxy, Nutr				Zoo-30	X Wa, Col, Tra	43.02-091
243.01 F-05	GYUNGBUG 885	05/09/1997	08/09/1997	52	17					X	Wa, Col, Tra	43.02-091

- DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC, OCEANOGRAPHY.
- † DENOTES DATA OBTAINED BY ELECTRONIC, IN-SITU, CONDUCTIVITY/SALINITY/TEMPERATURE/DEPTH (CTD/STD) SENSORS.
- †† ALL STATIONS AS A MINIMUM HAVE READINGS OF BOTH TEMPERATURE AND SALINITY, UNLESS OTHERWISE NOTED.

## ***WDC-A, OCEANOGRAPHY DATA INFORMATION***

The preceding section now lists primarily those data actually received directly by WDC-A from its international contributors, usually in either publications or in manuscript form. Data received in automated form from Data Centers (including the U.S. NODC), oceanographic institutions, or special project data centers are now identified and described in later sections of this Catalogue.

### ***LISTING OF ACCESSIONED DATA PUBLICATIONS***

WDC-A, Oceanography no longer publishes the yearly Supplements to the Catalogue of Accessioned Publications; thus, the Center can no longer present a full correlation of the catalogued data with corresponding published references. The following Listing of Accessioned Data Publications now references by title and responsible institution all publications received during the period that contain cataloguable data; it cross-references data publication information with the pertinent WDC-A Data Information Number.

## LISTING OF ACCESSIONED DATA PUBLICATIONS

WDC-A Publication No.	Data Publication Title	WDC-A Data Information No.
06	CANADA	
06.17-185	NOGAP B.6, Oxygen IsotopesData from Water and Ice Cores from the Beaufort Sea, May 1992 (Institute of Ocean Sciences, Patricia Bay, Canadian Data Report of Hydrography and Ocean Sciences, No. 149, 1997) (Microfiche)	106.22 O-05
06.17-186	WOCE Section P1W: Hydrographic Section through the Sea of Okhotsk (Institute of Ocean Sciences, Sidney, B.C., Canadian Technical Report of Hydrography and Ocean Sciences, No. 183, 1997) (Microfiche)	137.01 Q-02
06.17-187	WOCE Section P15N Hydrographic Section of the Pacific Ocean from Dutch Harbor, Alaska to American Samoa (Institute of Ocean Sciences, Sidney, B.C., Canadian Technical Report of Hydrography and Ocean Sciences, No. 184, 1997) (Microfiche)	106.22 U-03
14	GERMANY	
14.02-250	Beobachtungen auf den Deutschen Meßstation der Nord- und Ostsee im Jahre 1994 (Bundesamt fur Seeschiffahrt und Hydrographie, Meereskundliche Beobachtungen und Ergebnisse Nr. 82, 1997)	214.01
24	JAPAN	
24.04-054	Data Record of Oceanographic Observations and Exploratory Fishing, No. 41 (Hokkaido University, March 1998)	124.02 B-68, 124.02 C-21
24.22-051	Oceanographic Data in the Greenland Sea and Around Svalbard in 1991-1993 (NIPR Arctic Data Reports No. 3, National Institute of Polar Researcher, Tokyo, March 1998)	124.31 C-01, 124.31 D-01, 124.31 E-01
24.25-022	Prompt Report of the Oceanographic and Maritime Meteorological Observations in the Japan Sea in January to February 1997 (Oceanographic Prompt Report No. 399, Maizuru Marine Observatory, May 1997)	124.11 D-76

## LISTING OF ACCESSIONED DATA PUBLICATIONS

WDC-A Publication No.	Data Publication Title	WDC-A Data Information No.
24.25-023	Prompt Report of the Oceanographic and Maritime Meteorological Observations in the Japan Sea in April to May 1997 (Oceanographic Prompt Report No. 400, Maizuru Marine Observatory, August 1997)	124.11 D-76
24.25-024	Prompt Report of the Oceanographic and Maritime Meteorological Observations in the Japan Sea in June to August 1997 (Oceanographic Prompt Report No. 401, Maizuru Marine Observatory, October 1997)	124.11 D-76
24.25-025	Prompt Report of the Oceanographic and Maritime Meteorological Observations in the Japan Sea in October to November 1997 (Oceanographic Prompt Report No. 402, Maizuru Marine Observatory, February 1998)	124.11 D-76
24.25-026	Prompt Report of the Oceanographic and Maritime Meteorological Observations in the Japan Sea in December 1997 (Oceanographic Prompt Report No. 403, Maizuru Marine Observatory, April 1998)	124.11 D-76
39	UNITED STATES	
39.01-344	Data Report, Physical, Chemical, and Biological Data, CalCOFI Cruise 9702, 29 January - 15 February 1997; CalCOFI Cruise 9704, 2 - 20 April 1997 (Scripps Institution of Oceanography, Reference 97-13, 13 December 1997)	139.08 V-24 139.23 Y-38
39.01-345	Data Report, Physical, Chemical, and Biological Data, CalCOFI Cruise 9608, 7 - 25 August 1996; CalCOFI Cruise 9610, 10 October - 2 November 1996 (Scripps Institution of Oceanography, Reference 98-11, 16 May 1998)	139.08 V-25 139.08 Y-01
43	KOREA	
43.02-091	Annual Report of Oceanographic Observations for 1997 (National Fisheries Research and Development Agency, Volume 46, June 1998)	143.02 DD-04, 143.02 FF-02, 143.02 GG-02, 243.01 C-27, 243.01 F-05







## International Data Acquisition and Exchange

For the 40-year period since its inception during the International Geophysical Year (IGY), WDC-A, Oceanography has provided comprehensive tabulations of its yearly accessions and cumulative holdings as a reference standard by which the relative success of international oceanographic data exchange thru the WDC system (under both ICSU and IOC/IODE guidelines) can be measured. It has become increasingly apparent during recent years, however, that in order to maintain consistency and continuity in this process, WDC-A must significantly modify its traditional approach to take into account changing conditions. The advent of data acquisition programs, such as the Global Data Archaeology and Rescue (GODAR) Project, combined with enhanced capabilities to utilize CD-ROM technology and electronic data transmission for the rapid exchange of large data sets, have resulted in a major infusion of data into WDC-A's data bases.

A problem resulting from this obvious success story has been the difficulty that WDC-A has experienced in attempting to catalogue and tabulate these massive data sets, using standard (traditional) cataloguing procedures. Additionally, the sheer magnitude of many of these data sets (which may contain historical observations taken over many years) often tends to overshadow the all-important yearly data accessions from WDC-A's regular contributors. To address these problems, WDC-A has evaluated its most recent yearly data accessions with a view toward the need to give proper recognition to its regular contributors, while at the same time attempting to provide somewhat more detail with regard to data sets received through programs such as GODAR.

Through this process, the following general categories have been identified as representing major components of WDC-A's International Marine Data Base (**Figure 1**):

1. Regular accessions from WDC-A contributors representing observations that can be catalogued using standard (traditional) cataloguing procedures (**Tables 1-4**);
2. Historical data received under the aegis of the GODAR Program (**Tables 5-7**);
3. Data received in digital form through the co-located U.S. National Oceanographic Data Center (NODC) (**Tables 8-11**).

The International Marine Data Base of WDC-A, Oceanography, then, as depicted in Figure 1, now comprises the Center's total data holdings - that is, it summarizes data holdings from all three categories. Category 1 is defined as the material already identified and described in Part II of this Catalogue; explanations are further expanded upon on Page 30. Brief descriptions follow for Categories 2 and 3.

## Global Data Archaeology and Rescue (GODAR) Project

The goal of the GODAR program is to augment the historical digital oceanographic data archives by seeking out and recovering manuscript and digital ocean data not yet included in the digital ocean databases accessible to the world research community. The term Data Archaeology and Rescue describes the two-part process of first identifying and locating the data, and then performing the necessary steps to merge them into a digital database. The enhanced historical ocean data archives resulting from this Project have led to improved ocean climatologies and have also supported more complete studies of ocean variability. The following activities are undertaken as a part of the GODAR process:

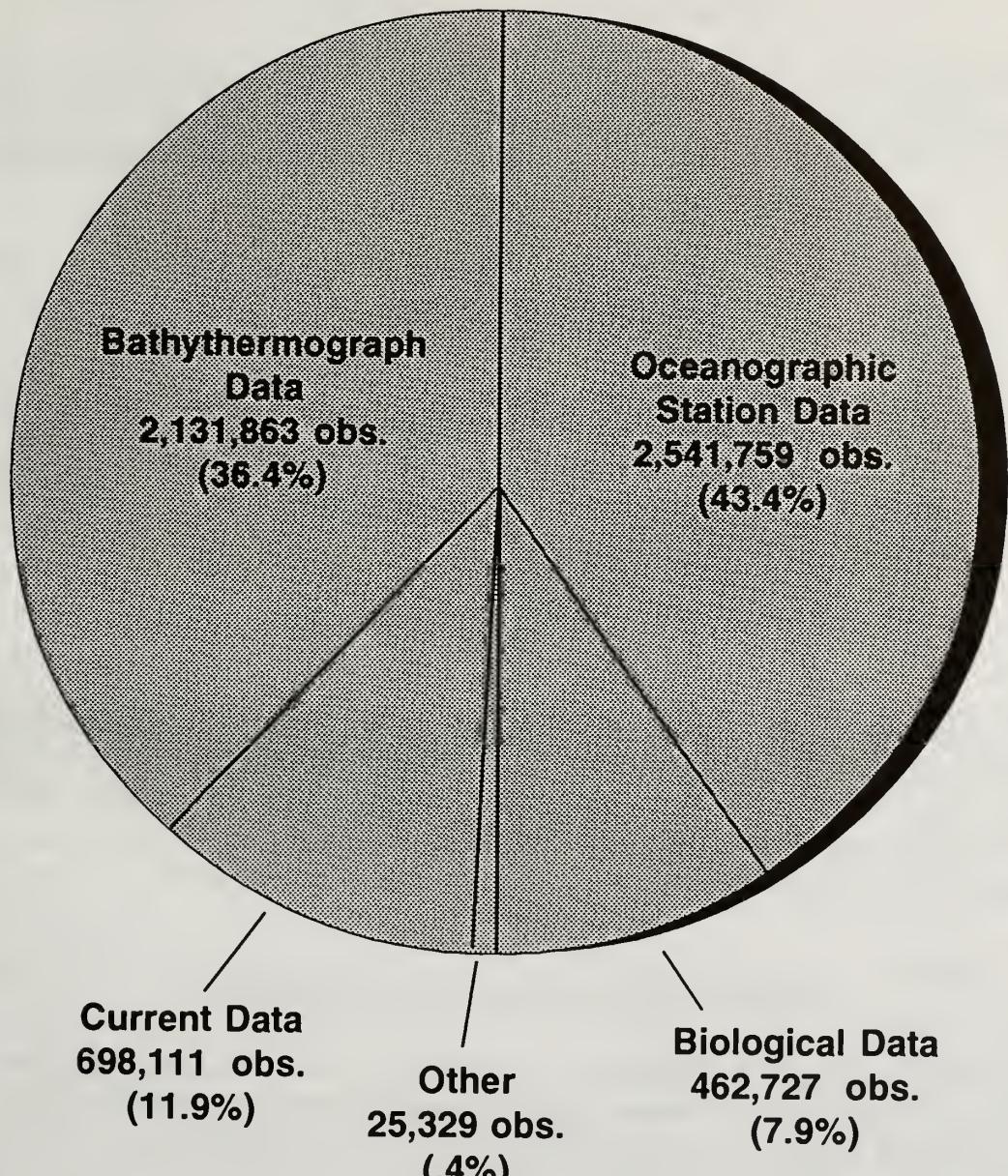
- prepare inventories of data available only in manuscript or other analog form, as well as data not currently available in digital form at a national or World Data Center;
- digitize data that now exist only in manuscript or other analog form;
- ensure that all oceanographic data available for international exchange are archived in digital form;
- perform Quality Control on all data;
- make all data readily accessible to the international community.

WDC-A has very substantially augmented its data bases through numerous GODAR contributions during recent years. Such contributions do not reflect, however, the total benefit derived from GODAR; many digitally-received GODAR contributions, that did not represent data "new" to WDC-A, were of equal importance because they represented data sets previously received by the WDCs in manuscript form only, as well as "rescued" data that had been held by originators on magnetic media that were susceptible to loss by degradation.

The basic premise of GODAR seems to engender a spirit of cooperation; many countries have contributed data that had previously been unavailable for international exchange. GODAR has also presented an excellent opportunity for developing countries to become more intimately involved with the IODE data management process. GODAR has provided a mechanism with the implementation of Regional Workshops, through which developing countries can facilitate the processing, exchange, and preservation of oceanographic data.

### Data Received in Digital Form through NODC

WDC-A benefits significantly from its co-location with the U.S. National Oceanographic Data Center (NODC). In addition to providing automated data management services in support of WDC-A, the NODC is an excellent source of oceanographic data in digital form for national, as well as international, data-gathering programs. Over the years, NODC has been a Special Project Data Center for numerous international cooperative investigations; this has led to the ready availability to WDC-A of many important international data sets in digital form.



**Figure 1. International Marine Data Base of WDC-A, Oceanography**

# WDC-A, Oceanography Data Base\* Summaries

## *Oceanographic Station Data Base*

Table 1 (page 31) summarizes the 1,351,841 oceanographic serial stations received by nation under which these data are catalogued. Nations from which no station data have been received are not listed, although in some cases publications or other types of data may have been received.

## *Bathythermograph Data Base*

Table 2 (page 33) summarizes the number of bathythermograph observations received from the nation under which the data are catalogued. The number of cruises on which the data were observed is also listed. A total of 603,004 bathythermograph observations were taken during 9,278 cruises, which includes 277 observations received in 1998.

## *Biological Data Base*

Table 3 (page 34) shows, by nation, the number of biological observations received by this Center since its inception and includes 1,830 observations received in 1998. A total of 173,405 observations, including plankton observations, primary productivity measurements, pigment concentration measurements, carbon-14 measurements, and fishery observations, have been taken during 2,184 cruises.

## *Surface and Subsurface Current Data Base*

Table 4 (page 35) summarizes, by nation, the number of surface and subsurface current measurements received by this Center since its inception. The total of 698,108 current measurements includes 113,598 subsurface and 584,510 surface measurements taken during 4,249 cruises. A total of 511 new current measurements were added in 1998.

\* Tabulations for these Data Bases (Tables 1 - 4) include cumulative historical and contemporary accessions of data from regular exchanges with WDC-A contributors, and represent *only* observations that could be catalogued using standard cataloguing procedures. Recent data accessions from the GODAR Program and of digital data sets from NODC are *not* included in Tables 1-4.

## Oceanographic Station Data Base

Table 1. -- Number of oceanographic serial stations received by WDC-A, Oceanography, from various nations

Nation	Stations Received in 1998	Total Stations on Hand prior to 1998	Total Stations on Hand at end of 1998
1. Argentina	--	2,833	2,833
2. Australia	--	19,256	19,256
3. Belgium	--	4,941	4,941
4. Brazil	--	7,496	7,496
6. Canada	--	75,904	75,904
7. Chile	--	1,048	1,048
8. Colombia	--	1,267	1,267
9. Denmark	--	40,701	40,701
10. Ecuador	--	2,234	2,234
11. Finland	--	39,194	39,194
12. Taiwan	--	693	693
13. France	--	23,399	23,399
14. Germany	2,279	66,136	68,415
16. Ghana	--	2,772	2,772
18. Iceland	--	10,567	10,567
19. India	--	2,094	2,094
20. Indonesia	--	2,352	2,352
21. Ireland	--	2,553	2,553
22. Israel	--	2,410	2,410
23. Italy	--	4,160	4,160
24. Japan	966	417,998	418,964
25. Mexico	--	1,517	1,517
26. Netherlands	--	10,377	10,377
27. New Zealand	--	1,941	1,941
28. Norway	--	40,152	40,152
29. Pakistan	--	174	174
30. Peru	--	4,016	4,016
31. Philippines	--	199	199

(continued)

## Oceanographic Station Data Base

Table 1. -- Number of oceanographic serial stations received by WDC-A, Oceanography, from various nations (continued)

Nation	Stations Received in 1998	Total Stations on Hand prior to 1998	Total Stations on Hand at end of 1998
32. Poland	--	9,174	9,174
33. Portugal	--	3,959	3,959
34. Spain	--	1,931	1,931
35. Sweden	--	56,975	56,975
36. South Africa	--	16,046	16,046
37. Russia	38	109,492	109,530
38. United Kingdom	--	51,911	51,911
39. United States	288	223,293	223,581
42. Yugoslavia	--	8,292	8,292
43. Korea	1,183	47,339	48,522
44. Ivory Coast	--	4,196	4,196
45. Nigeria	--	997	997
46. Congo (P. Rep.)	--	5,302	5,302
47. Malaysia	--	150	150
48. Malagasy Republic	--	1,311	1,311
49. Morocco	--	9	9
50. Senegal	--	1,795	1,795
51. Thailand	--	2,311	2,311
52. Turkey	--	637	637
53. Venezuela	--	2,184	2,184
60. Cuba	--	812	812
63. Romania	--	355	355
64. Egypt	--	308	308
68. Greece	--	217	217
71. Tunisia	--	157	157
73. China (P. Rep.)	--	9,139	9,139
75. Mauritania	--	411	411
<b>Totals</b>		<b>4,754</b>	<b>1,347,087</b>
			<b>1,351,841</b>

## Bathythermograph Data Base

Table 2. -- Number of bathythermograph observations received by WDC-A,  
Oceanography, from various nations thru 1998

Nation	No. of cruises	Type of data format				Total	
		Mechanical BT		Expendable BT			
		Analog	Tabular	Analog	Tabular		
1. Argentina	79	4,050	3,688	..	603	8,341	
2. Australia	683	..	9,460	1	28,234	37,695	
3. Belgium	2	..	15	..	..	15	
4. Brazil	7	43	85	..	485	613	
6. Canada	1,678	21,248	469	..	44,627	66,344	
7. Chile	8	846	..	..	165	1,011	
8. Colombia	2	316	..	..	..	316	
9. Denmark	2	70	..	..	..	70	
10. Ecuador	11	..	..	..	405	405	
11. Finland	2	124	168	..	..	292	
13. France	169	352	..	..	8,480	8,832	
14. Germany	395	59	14,258	..	19,537	33,854	
16. Ghana	1	12	..	..	..	12	
18. Iceland	50	124	7,075	..	..	7,199	
19. India	2	..	351	..	522	873	
20. Indonesia	13	162	118	..	..	280	
23. Italy	24	879	561	72	282	1,794	
24. Japan	3,390	..	166,878	..	59,668	226,269	
25. Mexico	23	..	..	..	378	378	
26. Netherlands	67	675	..	..	3,942	4,617	
27. New Zealand	21	..	..	..	1,108	1,108	
28. Norway	14	82	158	..	462	702	
29. Pakistan	2	..	65	..	..	65	
30. Peru	31	..	..	..	970	970	
31. Philippines	1	..	..	..	8	8	
32. Poland	7	..	153	..	279	432	
33. Portugal	24	448	2,725	12	194	3,379	
34. Spain	6	194	..	..	225	419	
35. Sweden	6	10	57	..	612	679	
36. South Africa	2	..	..	..	140	140	
37. Russia	115	428	12,395	..	5,388	18,211	
38. United Kingdom	1,380	276	44,973	..	17,844	63,093	
39. United States	942	36,114	3,489	646	59,997	100,246	
43. Korea (Rep. of)	28	..	1,427	..	276	1,703	
44. Ivory Coast	6	618	..	..	..	618	
45. Nigeria	6	1,011	20	..	..	1,031	
46. Congo (P. Rep.)	21	2,389	83	..	..	2,472	
48. Malagasy Rep.	10	476	..	..	..	476	
50. Senegal	8	730	..	..	..	730	
70. Sierra Leone	2	194	..	..	..	194	
71. Tunisia	1	..	121	..	..	121	
73. China (P. Rep.)	7	..	..	..	620	620	
99. Ships of Opportunity (International)	30	..	..	..	6,100	6,100	
<b>Total</b>	<b>9,278</b>	<b>71,930</b>	<b>268,792</b>	<b>731</b>	<b>261,551</b>	<b>603,004</b>	

## Biological Data Base

Table 3. -- Number of biological observations received by WDC-A, Oceanography,  
from various nations thru 1998

Nation	No. of cruises	Type of observation				
		Plankton	Primary Productivity	Pigments	C-14	Fishery
1 Argentina	13	452	47	233	129	—
2 Australia	64	1,527	1,599	1,738	—	2,666
4 Brazil	16	754	—	175	—	36
6 Canada	58	1,342	669	1,303	47	100
8 Colombia	7	181	—	496	—	—
10 Ecuador	3	895	191	116	—	—
12 Taiwan	3	98	—	98	—	15
13 France	28	720	288	510	43	92
14 Germany	26	594	238	2,901	1,552	731
19 India	12	424	—	—	—	—
20 Indonesia	61	2,004	5	702	—	7
22 Israel	1	58	—	—	—	—
23 Italy	1	18	18	18	—	—
24 Japan	1,256	43,589	180	24,446	30	7,996
25 Mexico	14	111	13	404	—	—
26 Netherlands	2	150	24	36	—	—
27 New Zealand	1	46	—	69	71	—
29 Pakistan	1	14	—	—	—	—
30 Peru	7	517	3	27	10	12
32 Poland	1	—	—	81	—	—
33 Portugal	5	351	—	128	—	57
34 Spain	7	66	87	175	—	27
35 Sweden	1	—	18	—	—	—
36 South Africa	22	985	165	356	—	—
37 Russia	12	3,837	743	262	—	389
38 United Kingdom	6	416	—	99	—	—
39 United States	319	12,003	5,858	13,821	745	4,445
42 Yugoslavia	1	167	—	—	—	—
43 Korea (Rep. of)	186	20,634	—	—	—	—
44 Ivory Coast	3	27	7	—	—	1
45 Nigeria	6	5	4	—	—	2,018
46 Congo (P. Rep.)	4	24	93	70	—	1
48 Malagasy Rep.	9	84	54	54	—	—
50 Senegal	11	34	—	477	—	258
60 Cuba	1	—	37	—	—	—
63 Romania	10	261	—	—	—	—
64 Arab Rep. of Egypt	2	—	—	—	—	188
71 Greece	1	3	4	—	—	—
73 China (P. Rep.)	2	—	68	139	—	—
75 Mauritania	1	—	—	—	—	1
<b>Total</b>	<b>2,184</b>	<b>92,391</b>	<b>10,413</b>	<b>48,934</b>	<b>2,627</b>	<b>19,040</b>

## Surface and Subsurface Current Data Base

Table 4. -- Number of surface and subsurface current measurements received by WDC-A, Oceanography, from various nations thru 1998

Nation	No. of cruises	Subsurface	Surface
2. Australia	50	1,663	—
4. Brazil	1	83	—
6. Canada	21	1,558	1,052
9. Denmark	62	—	20,184
10. Ecuador	1	46	9
11. Finland	6	5,472	5708
13. France	20	6,450	632
14. Germany	115	10,794	327,348
20. Indonesia	13	177	40
23. Italy	2	782	—
24. Japan	3,631	18,302	191,036
25. Mexico	6	—	6,816
26. Netherlands	21	10,242	—
28. Norway	6	2,691	86
32. Poland	2	291	—
33. Portugal	4	74	—
35. Sweden	116	22,751	24,237
37. Russia	49	20,660	1,510
38. United Kingdom	9	799	258
39. United States	58	4,493	4,940
42. Yugoslavia	25	603	149
43. Korea (Rep. of)	2	—	284
44. Ivory Coast	3	44	140
46. Congo (P. Rep.)	3	218	—
48. Malagasy Rep.	1	24	24
52. Turkey	1	5,095	40
63. Romania	19	284	17
<b>Total</b>	<b>4,249</b>	<b>113,598</b>	<b>584,510</b>

Table 5. Oceanographic station data received through GODAR, 1998

NATION	DATA SET	NO. OF STATIONS
Canada	North Atlantic Bottle data, 1966 - 1985	625
Canada	Pacific and Atlantic CTDs, 1990 - 1996	9,700
Canada	Vancouver Island	263
France	SISMER, CTD and Bottle data	1,968
Germany	CTD and Bottle data from 1920 - 1989	54,496
Germany	Southern Oceans CTDs	1,672
Italy	Adriatic Biogeochemical Dataset	5,505
P. Rep. of China	East and South China Seas	6,462
Russia	VNIRO, Kara Sea	72
Russia	VNIRO, 1897, 1967 - 1996	1,051
Russia	Murmansk Observation Center for Environmental Pollution, Barents and Norwegian Seas	568
Russia	Institute of Experimental Meteorology	2,278
Russia	OB, FEDOROV and ZUBOV cruises	164
Russia	1947-1948 Barents Sea Bottle data	1,232
Ukraine	N. Atlantic Current Sections Bottle data	2,880
Ukraine	Sections near Odessa	3,315
United Kingdom	Hydrographic Office Profile Data Cards	70,982 *
United Kingdom	Hydrographic Office Surface Data Cards	336,939 *

\* These totals represent the numbers of observations digitized during OCL/WDC-A's Data Rescue Project to scan and digitize the United Kingdom Hydrographic Office's historical collection of Surface and Profile Data Cards

Table 6. Bathythermograph observations received through GODAR, 1998

NATION	DATA SET	NO. OF OBS.
Russia	YugNiro MBTs	105
P. Rep. of China	East and South China Seas XBTs	3,969

Table 7. Biological observations received through GODAR, 1998

NATION	DATA SET	NO. OF OBS.
Canada	Vancouver Island biochemistry	566
Canada	North Atlantic Biochemical data	1,488
Italy	Adriatic Biogeochemical Dataset	633
Russia	Kara Sea, 1936 Plankton	69
United States	NE Pacific (University of Hawaii)	188
United States	MARMAP Chlorophyll Data Base, NW Atlantic	9,118

Table 8. Oceanographic station data received through NODC, 1998

NATION	DATA SET	NO. OF STATIONS
United States	Mamala Bay Project	25
United States	U. Alaska , Inst. MarineScience	39
United States	BIOWATT-87, Lamont-Doherty	59
United States	National Marine Fisheries Service Alaska Fisheries Science Center Trawl Surveys	3,113
United States	SIO Coastal Studies Center	300
United States	Bermuda Biological Station	741
United States	North Carolina Coast	36
United States	NSF, Polar Programs	157
United States	GLOBEC Project	761
United States	New Hampshire Coast/Open Ocean	114
United States	Santa Monica Bay, California	15,659
United States	JGOFS / ArabianSea	1,360
United States	CalCOFI Cruises	288
United States	Kokohead shoreline, Oahu, Hawaii	3,227
United States	CUEA	341
United States	CRETM/Land Margin Ecosystem Research Project	9,559
United States	FOCI	789
United States	Oregon Coastline	33
United States	Southern California Bight	472
United States	Resurrection Bay, AK Time series	175
United States	NOAA/NMFS, Georges Bank	718
United States	NOAA/NOS, US East Coast	275

Table 9. Bathythermograph observations received through NODC, 1998

NATION	DATA SET	NO. OF OBS.
Australia	CSIRO, Pacific and Indian Ocean	2,963
Australia	Royal Australian Navy, Pacific and Indian Ocean	4,101
France	IFREMER data holdings	1,327
United States	Shipboard Environmental Data Acquisition System (SEAS), Ships of Opportunity Program	15,726
United States	NMFS Alaska Fisheries Science Center Trawl Surveys	7,037
United States	Scripps Institution of Oceanography	3,869

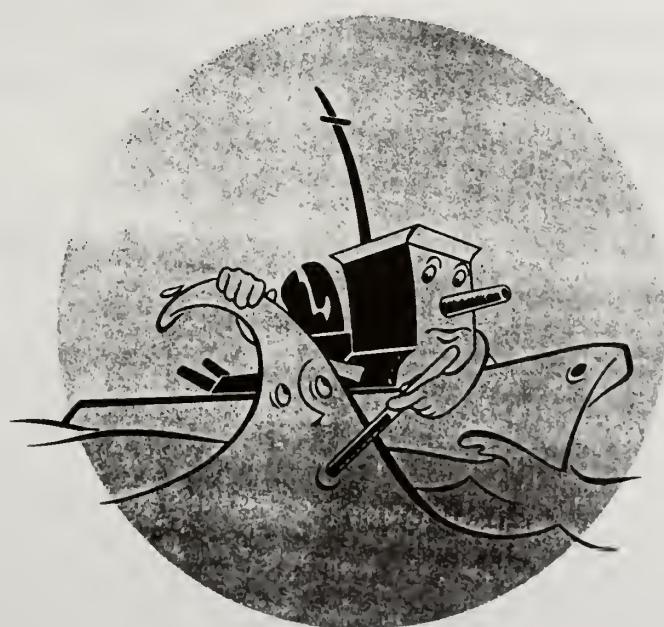


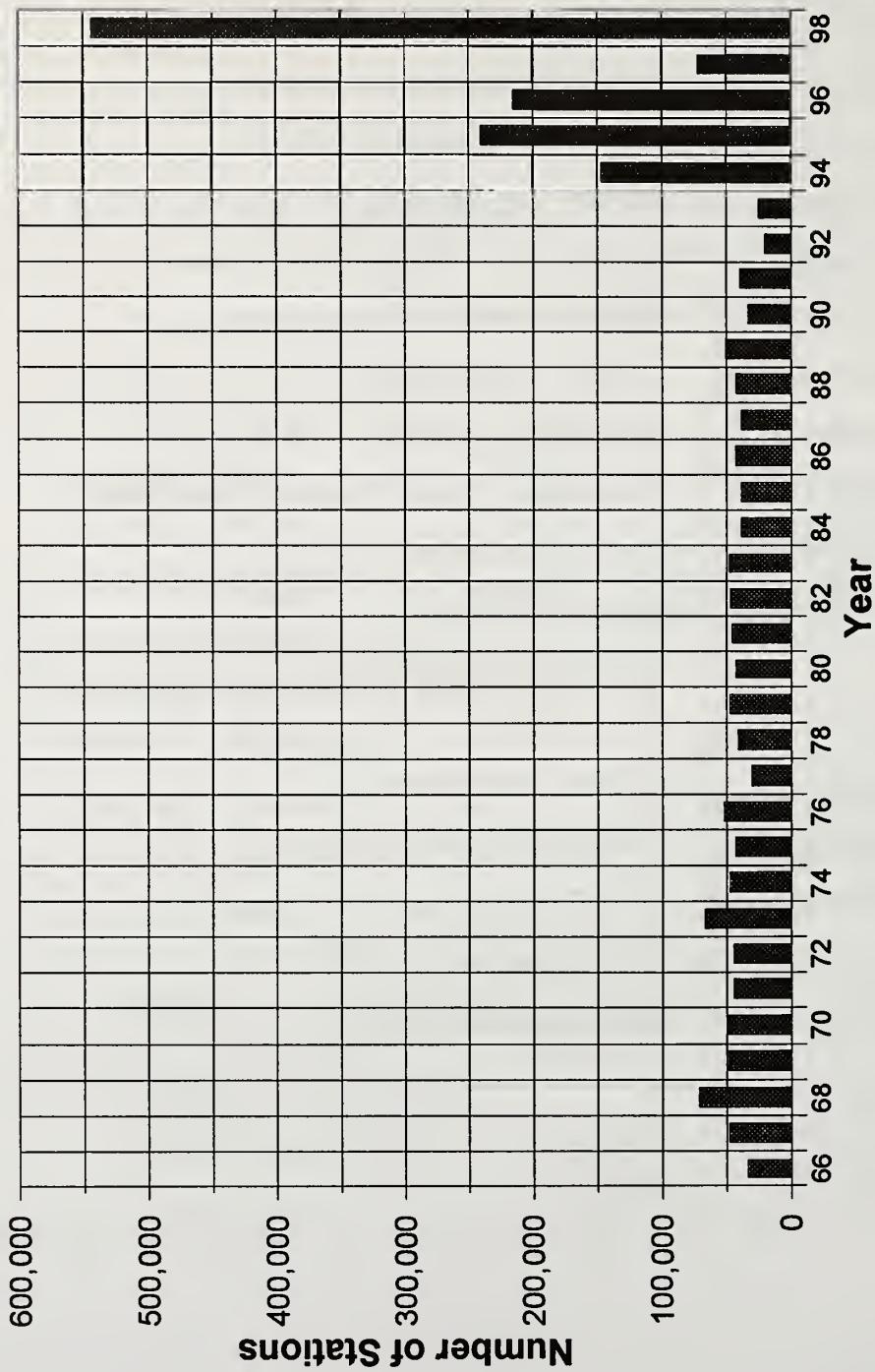
Table 10. Current Meter data sets received through NODC, 1998

NATION	DATA SET	PERIOD
Canada	RNODC Drifting Buoy	1993 - 1997
Canada	N. Atlantic	Nov 1976 - Apr 1980
United States	N.E. Pacific	October 1998
United States	N.E. Pacific	September 1998
United States	Red Tides Program, Gulf of Maine	Mar - Jul 1993
United States	NE Greenland Shelf, Polynya Project	Jul 1992 - Jul 1993
United States	Massachusetts & Cape Cod Bays	Jan 1990 - Jun 1991
United States	GLOBEC- Georges Bank	Jan 1995 - Dec 1996
United States	GLOBEC- Georges Bank	Mar - Jun 1995
United States	EPOCS Program	Apr 1994 - Mar 1995
United States	JGOFS - Arabian Sea	Jul - Nov 1995
United States	Hawai Oligotrophic Habitat Assessment	May - Dec 1997
United States	GLOBEC- Georges Bank	Jan - Oct 1996
United States	Red Tides Program, Gulf of Maine	Feb - Nov 1994
United States	Southern California Bight	Oct 1985 - Apr 1989
United States	Drifting buoys along U.S. Coasts	Dec 1997 - May 1998
United States	VENTS Project	Jun 1996 - Jul 1997
United States	VENTS Project	Oct 1997 - Aug 1998
United States	West Maui Watershed Management, Algal Bloom Studies	Sep 1994 - Apr 1996

Table 11. Biological observations received through NODC, 1998

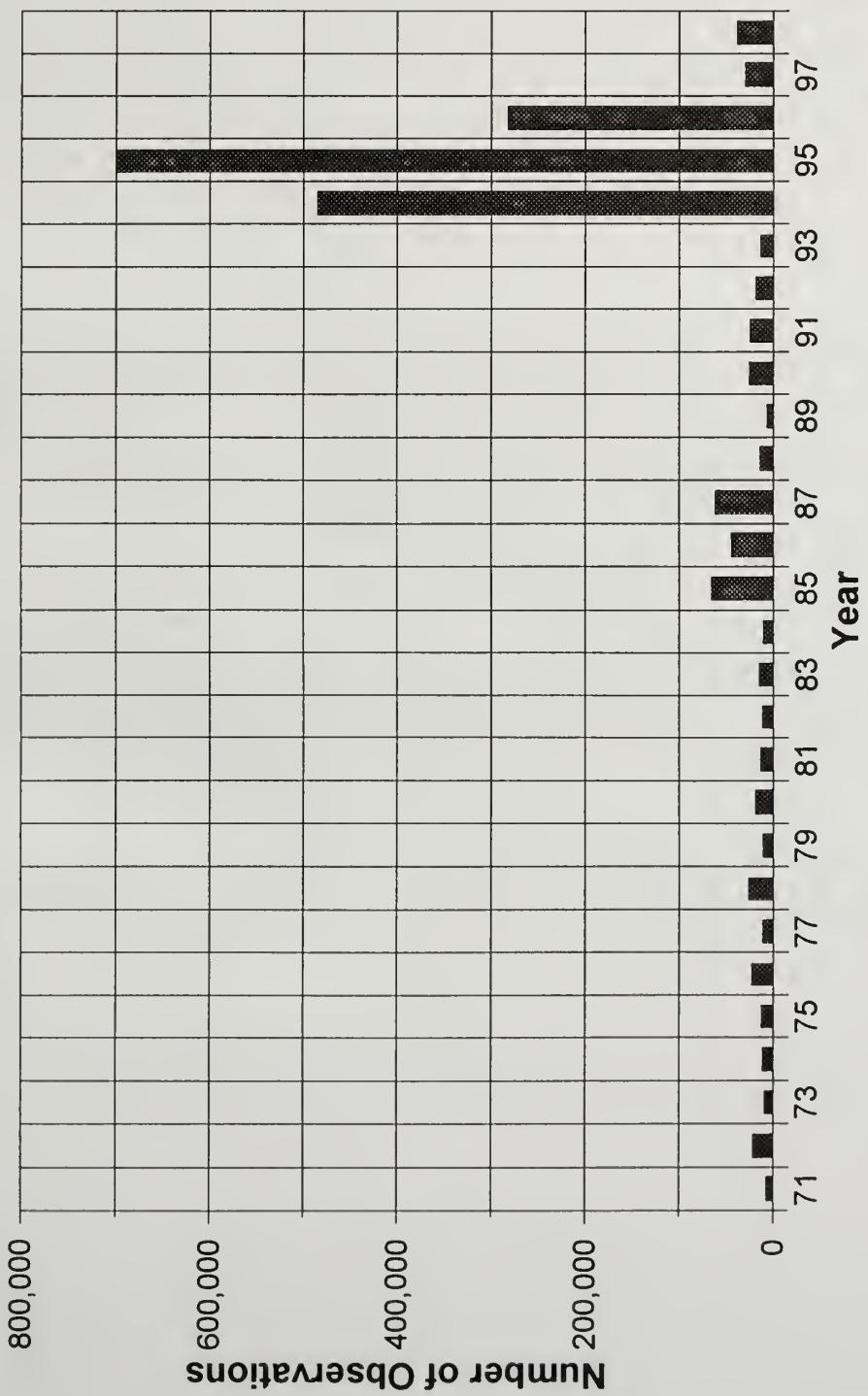
NATION	DATA SET	NO. OF OBS.
United States	Arabian Sea biomass	122
United States	Arabian Sea biomass/zooplankton	29
United States	Arabian Sea chlorophyll (LIDAR)	139,000
United States	Arabian Sea pigments	471
United States	Arabian Sea plankton	466
United States	Arabian Sea primary productivity	202
United States	CalCOFI productivity	288
United States	Labrador Sea plankton	33
United States	Mamala Bay (Oahu, HI) bacteria/water quality	77
United States	Mamala Bay benthos	36
United States	Mamala Bay biota	120
United States	North Pacific productivity	68
United States	Oregon Coast	253
United States	PROBES zooplankton	1,080
United States	Prince William Sound plankton	2,000
United States	South California Bight benthos	252
United States	Washington Coast benthos	160
United States	Venezuela Coast biology	5

## Number of Oceanographic Stations Received at WDC-A by Year



1994 through 1998 totals include IOC/IODE/GODAR

## Number of Bathymographs Received at WDC-A by Year



1994 through 1998 totals include IOC/IODE/GODAR



**PART IV**

**DATA HOLDINGS OF**

**RNODC's AND**

**SPECIALIZED DATA CENTERS**



## DATA HOLDINGS of RNODC's and SPECIALIZED DATA CENTERS

This section of the Change Notice provides information on the availability of specialized data sets prepared by the various Responsible National Oceanographic Data Centers (RNODC's) and other Specialized Data Centers. Normally, only those data sets that have actually been received by WDC-A, Oceanography are described in this section; WDC-A can provide digital copies of these data sets either in the originator's format or in the prescribed international exchange format.

These data products are not described in the usual manner in the Catalogue portion of the Change Notice (except for certain separately-identified cruises that are also included in data sets such as FOY), as the data are not always merged with the standard WDC-A, Oceanography data bases. Thus they constitute a suite of data products, prepared by RNODC's and other Specialized Data Centers, that are separate and distinct from the standard data types regularly catalogued in the Change Notices and normally available from WDC-A.

Such data products are not necessarily intended to be routinely exchanged by the WDC's under normal international data exchange guidelines. They may be voluminous or costly to prepare and, thus, may be precluded from regular data exchanges between WDC's and their exchange cooperators. Data sets in automated form are available from the WDC's usually at a cost not to exceed the cost of reproduction and postage.

**MEDALPEX**



**IGOSS**



# RNODC FOY

## FGGE OPERATIONAL YEAR GLOBAL OCEAN CLIMATE DATA BASE

The Global Ocean Climate Data Base is available from the National Oceanographic Data Center (NODC) which served as the Responsible National Oceanographic Data Center for the FGGE\* Operational Year (RNODC/FOY). The Global Ocean Climate Data Base is a collection of oceanographic data submitted to NODC by 17 different countries. Although the formal FGGE Operational Year was from 1 December 1978 to 30 November 1979, the data set covers the extended FOY period from 1 September 1978 to 29 February 1980.

The data base includes four types of data: (1) oceanographic hydrocast (bottle) data, (2) conductivity/ salinity-temperature-depth (C/STD) data, (3) expendable bathythermograph (XBT)

data, and (4) Eulerian current (current meter) data. The data are recorded on magnetic tape in two different formats: (1) the Intergovernmental Oceanographic Commission General Exchange Format 3 (GF3) and (2) NODC archive formats (different format for each of the four types of data). In GF3 the data base comprises eight magnetic tapes; in the NODC formats the data base comprises four tapes.

The FGGE Operational Year was the culmination of a series of international ocean/atmosphere research programs conducted in the 1970's. This effort, in turn, was a steppingstone toward the increasingly ambitious and large-scale research and monitoring programs of the 1980's and 1990's that are directed toward fuller understanding of tropical dynamics and their influence on global ocean/atmosphere phenomena.

\*FGGE = *First GARP Global Experiment, also known as the Global Weather Experiment.*  
GARP = *Global Atmosphere Research Program.*



## The FGGE/FOY Data Base

The FGGE/FOY Global Ocean Climate Data Base compiled by the RNOOC contains: 10,413 Oceanographic hydrocast (bottle) stations; 4,030 CTD/STD casts; 28,733 expendable bathythermograph (XBT)

temperature profiles; and 294 months of time-series data from current meter moorings. The sources of these data are summarized in Table 1.

**Table 1. FGGE Operational Year Global Ocean Climate Data Base**

Country	Data Type			
	Oceanographic Stations (stations)	CTD/STD (stations)	XBT (stations)	Current Meter (meter-months)
Australia	--	--	2,754	--
Canada	324	--	507	--
People's Republic of China	318	--	--	--
Republic of the Congo	307	--	--	--
France	--	--	307	--
German Democratic Republic	74	--	--	--
Federal Republic of Germany	--	--	1,366	--
Ghana	335	--	--	--
Italy	--	--	55	--
Japan	1,138	--	832	--
Philippines	--	--	8	--
Poland	87	--	267	--
Republic of South Africa	--	--	56	--
Spain	--	--	180	--
UK	--	64	944	--
USA	1,271	3,966	20,727	294
USSR	6,559	--	730	--
<b>TOTAL</b>	<b>10,413</b>	<b>4,030</b>	<b>28,733</b>	<b>294</b>

Table 2 lists the number of tapes included in the data set. Customers may order the entire set of

tapes or only the tape(s) for one or more of the four different data types in either of the two format options.

**Table 2. FOY Global Ocean Climate Data Tapes**

<b>Data Type</b>	<b>Data Quantity</b>	<b>Number of Tapes</b>	
		<b>GF3 Format (1600 bpi)</b>	<b>NODC Format (6250 bpi)</b>
Oceanographic Station (hydrocast)	10,413 stations (128 <i>cruises</i> )	2	1
CTD/STD	4,030 stations (62 <i>cruises</i> )	1	1
XBT	28,733 stations (571 <i>cruises</i> )	3	1
Current Meter	294 months (27 <i>meters</i> )	2	1
<b>TOTAL</b>		<b>8</b>	<b>4</b>

## **Data Availability**

Copies of the FOY Global Ocean Climate Data Set are available from the RNODC as ASCII files on floppy disk or via FTP over the internet:

World Data Center A, Oceanography  
NOAA  
Silver Spring, MD 20910-3282, USA

Telephone: 301-713-3295  
FAX: 301-713-3303  
E-mail: wdca@nodc.noaa.gov

# ***RNODC MEDALPEX (Sea Level)***

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## **MEDITERRANEAN ALPINE EXPERIMENT SEA LEVEL DATA SET**

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In 1975, the IOC decided to support the development of an oceanographic program in the Mediterranean during the GARP Alpine Experiment (ALPEX). The MEDALPEX project took place between 1 September 1981 and 30 September 1982, with a special period of observation from 15 February 1982 to 30 April 1982. It was a multi-national project involving scientists from 7 countries.

The main purpose of MEDALPEX was to increase understanding of the effect of wind forcing on the dynamics of the western part of the Mediterranean Basin. Specific studies were undertaken, each having a particular scientific objective including:

1. The interrelationship between the general circulation and mesoscale eddies
2. Offshore dynamic response mechanisms under severe weather conditions
3. Storm surges and the piling up of water, especially in the Adriatic and Ligurian seas

The measurement of sea level was considered to be an important component of the observation program to support these studies. A wide range of other types of oceanographic data were also collected, including classical and synoptic meteorological measurements, data collected using remote sensing techniques and data from current meters, thermistor chains, waverider buoys, CTDs and XBTs.

The Permanent Service for Mean Sea Level (PSMSL) was requested by IOC to fulfil the role of the Responsible National Oceanographic Data Center for the MEDALPEX sea level data. The work was undertaken on behalf of PSMSL by the Marine Information and Advisory Service (MIAS) - U.K.'s national oceanographic data center (now the British Oceanographic Data Centre.)

Sea level data were submitted to MIAS from 29 of the 40 MEDALPEX sites. An inventory of the data is given on the following page. Measurements from 28 of the sites were taken using conventional stilling wells and, with one exception, were supplied to MIAS as hourly values. Data from the remaining site, off the coast of Corsica, were collected by an Aanderaa water level recorder at half-hourly intervals.

**INVENTORY OF DATA RECEIVED**  
**BY MEDALPEX SEA LEVEL DATA CENTER**

SITE	LATITUDE	LONGITUDE	START DATE	SERIES DURATION	CYCLE INTERVAL
	DDD MM.MH	DDD MM.MH	DD/MM/YY		
CADIZ	36 32.0N	6 17.0W	01/09/81	56	3600
TARIFA	36 0.0N	5 36.0W	01/09/81	56	3600
GIBRALTAR	36 8.0N	5 21.0W	01/09/81	56	3600
CEUTA	35 54.0N	5 19.0W	01/09/81	56	3600
ALGECIRAS	36 7.0N	5 26.0W	01/09/81	56	3600
PUERTOS BANUS	36 37.0N	4 55.0W		NO DATA	
MALAGA	36 43.0N	4 25.0W	01/09/81	56	3600
ALMERIA	36 49.7N	2 29.2W	14/08/81	58	3600
CARTEGENA	37 36.0N	0 59.0W		NO DATA	
ALICANTE I	38 20.3N	0 30.4W	23/08/81	60	3600
ALICANTE III	38 20.3N	0 30.7W	28/08/81	60	3600
PALMA DE MALLORCA	39 33.0N	2 38.0E	01/09/81	56	3600
BLANES	41 41.0N	2 48.0E		NO TIDE GAUGE	
ROSAS	42 15.0N	3 11.0E		NO TIDE GAUGE	
PORT VENDRES	42 31.0N	3 6.0E	28/12/81	39	3600
SETE	43 25.0N	3 43.0E		NO DATA	
FOS	43 25.0N	4 46.0E		NO DATA	
TOULON	43 7.0N	5 55.0E	30/08/81	56	3600
NICE	43 42.0N	7 16.0E	03/07/81	68	3600
MONACO	43 44.0N	7 25.0E	29/06/81	69	3600
OFFSHORE	42 34.8N	8 44.0E	06/04/82	18	1800
NEAR CALVI	42 34.8N	8 44.0E	29/07/82	9	1800
AJACCIO	41 55.0N	8 43.0E	30/08/81	49	3600
CAGLIARI	39 13.0N	9 8.0E		NO DATA	
SAVONA	44 18.0N	8 28.0E		NO DATA	
GENOVA	44 24.0N	8 54.0E	31/08/81	58	3600
LA SPEZIA	44 7.0N	9 48.0E		NO DATA	
LIVORNO	43 33.2N	10 18.2E	31/08/81	49	3600
CIVITAVECCHIA	42 5.7N	11 47.4E	25/08/81	22	3600
NAPOLI	40 50.4N	14 16.2E	31/08/81	56	3600
PALERMO	38 8.0N	13 23.0E		NO DATA	
ANCONA	43 37.0N	13 31.0E	01/09/81	56	3600
PTO CORSINI	44 35.0N	12 20.0E		NO DATA	
VENEZIA	45 26.0N	12 20.0E	01/01/81	104	3600
KOPER	45 33.0N	13 44.0E	28/02/82	9	3600
ROVINJ	45 5.0N	13 38.0E	28/02/82	9	3600
BAKAR	45 18.0N	14 32.0E	28/02/82	9	3600
ZADAR	44 5.4N	15 16.3E	28/02/82	9	3600
NOVALJA	44 33.3N	14 13.2E	28/02/82	9	3600
SPLIT	43 30.0N	16 26.0E	28/02/82	9	3600
DUBROVNIK	42 40.0N	18 4.0E	28/02/82	9	3600
BAR	42 5.0N	19 5.0E	28/02/82	9	3600

In compiling the dataset, MIAS translated all incoming data into a common format with elevation values standardized to meters and times to GMT. The data for each site were plotted as a time series and checks were carried out for gaps or constant values, spikes, spurious data or punching errors. Further checks were carried out by tidally analyzing and low pass filtering the data. Non-tidal fluctuations were investigated using principal component analysis. Qualifying information applicable to the data from each site was checked for inconsistencies and completeness, and appropriate documentation was stored with the data in the form of plain language records. The complete quality controlled dataset, including documentation, has been stored on a single magnetic tape formatted in GF3, the IOC's standard format for the exchange of oceanographic data. A copy of the data set may be obtained as ASCII files on floppy disk or via FTP over the internet from:

World Data Center A, Oceanography  
NOAA  
Silver Spring, MD 20910-3282  
U.S.A.

E-mail: [wdca@nodc.noaa.gov](mailto:wdca@nodc.noaa.gov)

or

RNODC/MEDALPEX Sea Level Data  
BODC  
Bidston Observatory  
Merseyside L43 7RA  
U.K.

E-mail: [bodcmail@ua.nbi.ac.uk](mailto:bodcmail@ua.nbi.ac.uk)

# RNODC DRIBU

## RNODC FOR DRIFTING BUOYS

### Background

The Marine Environmental Data Service (MEDS) began operation of the RNODC/Drifting Buoy Data in January 1986. The RNODC acquires Drifting Buoy Data from worldwide sources, makes the data available to international scientific programs, and prepares geographical plots of Drifting Buoy locations and tracks for the world oceans on a monthly basis. The RNODC also provides monthly statistics of operational buoys and the number of messages received from them.

### Acquisition of Drifting Buoy Data

There are three procedures by which Drifting Buoy Data are received by the RNODC. The first and more traditional is for the principal investigator to submit his data directly to the RNODC, or to his National Oceanographic Data Centre which in turn submits the data to the RNODC. For historical data sets, this is the only option available. Data received in this way are usually of the highest quality, since they have undergone the most discriminating calibration and quality control procedures under the direction of the principal investigator; however, data entering the system in this manner are not sufficiently timely to meet the operational requirements of the major global science programs.

The second path for data flow to the RNODC is via the GTS. An advantage of this procedure is that the data are available in time scales suitable for the operational requirements of researchers in programs such as TOGA and WOCE, as well as for other operational users such as meteorological forecasters. Data received in this way may be less accurate, because they have not been fully reviewed and assessed by the principal investigator. For drifting buoy data, there is also a problem in that using the DRIBU format on the GTS for some buoys may limit the data that can be transmitted, because of a requirement to restrict the information to 256 bits.

A third procedure involves retrieving the DRIBU data as they pass through Services ARGOS. Although these data still have not been reviewed and assessed by the principal investigator, they are an improvement over the GTS data in that both time of observation and position time are available to improve velocity calculations. Data received by Service ARGOS are stored on magnetic tape for a period of 90 days. After this time, the tapes are reused and the data then reside solely in the hands of the principal investigators. Canada and the United States

have agreed to share the cost of buying copies of these tapes for the RNODC. Data from a buoy can only be provided to the RNODC if the principal investigator has given consent in writing.

#### RNODC/Drifting Buoy Data Base

MEDS utilizes a hierarchical database, called System 2000, to store the drifting buoy data; because of the volume of data, each year of data is stored in its own data base. In order to provide services to users at all time scales and to have available at each time scale the best data possible, the RNODC has decided to accept all data using the following hierarchical guidelines:

1. Where possible, Principal Investigators are requested to make their data available to other operational users and to the RNODC by having the data transmitted on the GTS. The RNODC will copy all available data from the GTS, quality control it, and update it into the data base on a weekly basis.
2. Principal Investigators are also requested to agree to have Service ARGOS provide a copy of their data to MEDS via tape each month whether or not those data have already been on the GTS. The data circulated on the GTS have only the one time included which poses a difficulty in calculating velocities. Thus, the tape data with the two times is an improvement to the database and will be used to replace the GTS data in the database. In addition, data will be picked up which could not be circulated on the GTS because of the format of the transmission from the buoy.

If Service Argos has not already been supplied with the calibration constants, channel allocations, and algorithms, or has not been requested to make the conversions to physical units, there will be a requirement for the RNODC to obtain this information from the principal investigators. Principal investigators are reminded that if the sensor data cannot be made available, the position data itself is of value for the database.

3. Principal Investigators are requested to provide a copy of their Drifting Buoy Data either directly to the RNODC when the fully processed, quality controlled version is available, or to provide the data to their National Oceanographic Data Centre, where the RNODC will be requesting such data on a regular basis. Data received by this path will replace GTS or Service ARGOS versions of the data in the database.

By receiving data in the configuration set forth above, and replacing earlier, lower quality data as higher quality versions of the data arrive, the RNODC can offer users a choice between timeliness and quality, as dictated by their particular requirements.

The RNODC recognizes that in some cases there exists a need to restrict distribution of data to protect a scientist's right to benefit first from collection activities carried out at considerable effort and cost. It is noted that the large international experiments generally have data exchange agreements that state when the data are available to other participants and to those outside the program. The RNODC will honor such data exchange agreements and will, at a scientist's request, restrict further distribution of the data according to the terms of the pertinent agreement. In regard to data from individual scientists, bilateral agreements on further distribution of data for a period of up to two years can also be made.

### RNODC Services

As mentioned earlier, the RNODC maintains its drifting buoy data in a data base structure. This provides maximum flexibility when meeting a request. While a number of different qualifiers may be used to retrieve data, the most common are area and time. Requesters may also specify all data or only those which have passed the quality control procedures. On output, the data can be written on various computer media, such as computer diskette, CD-ROM, 8-mm cartridge, DAT and DLT tapes, in a standard subset of the GF3 formatting system or in some other agreed ad hoc character format. In choosing the data format, users should be aware that the GF3 Formatting System is supported by a powerful and growing software system which is available for many of the more widely used host computers. Note that the data can also be downloaded using File Transfer Protocol (FTP) over the Internet.

Each month, the RNODC publishes a summary of the data it has received in real time; also produced are global maps of drifting buoy tracks for the previous month. These maps are issued regularly on a monthly basis. Anyone wishing to receive this summary should contact the RNODC. There is no charge to receive this product.

To obtain the RNODC Drifting Buoy Data Set, requesters should contact one of the following:

RNODC for Drifting Buoy Data  
Marine Environmental Data Service  
Department of Fisheries and Oceans  
200 Kent Street  
Ottawa K1A 0E6 Canada

Telephone: 613-990-0243  
FAX: 613-993-4658  
Email: [services@meds-sdmm.dfo-mpo.gc.ca](mailto:services@meds-sdmm.dfo-mpo.gc.ca)

World Data Center A,  
Oceanography  
NOAA  
Silver Spring, MD 20910-3282  
U.S.A.

Telephone: 301-713-3295  
FAX: 301-713-3303  
Email: [wdca@nodc.noaa.gov](mailto:wdca@nodc.noaa.gov)

# TOGA

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## TROPICAL OCEAN and GLOBAL ATMOSPHERE PROGRAMME

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### TOGA Background

A major component of the TOGA International Implementation Plan was the monitoring of the global atmosphere and the upper layers of the three tropical oceans during the ten-year period of 1985-1994. Existing meteorological and oceanographic observation systems were maintained and expanded by TOGA, while new networks were also installed in key locations. These observations, along with available historical data, have provided a description of the ocean-climate system and its variability from sub-seasonal to interannual scales.

### TOGA Tropical Subsurface Data Centers

The TOGA Tropical Subsurface Data Centre in Brest, France operated within the framework of both the IOC's International Oceanographic Data and Information Exchange (IODE) system and the Joint IOC-WMO Integrated Global Ocean Services System (IGOSS). This Centre has been continued for the WOCE program as the Global Subsurface Data Centre. The Centre collects subsurface ocean observations from the following sources: (1) tropical oceans observations from the IGOSS network; (2) additional vertical temperature profiles from XBT's and from drifting or moored buoys with thermistor chains, not sent over the GTS; (3) time series of temperature and salinity at fixed depth from moored thermistor chains; (4) surface temperature and salinity data and vertical profiles of temperature and salinity from CTD's, bottle casts, and WCTD's; and (5) other subsurface ocean measurements from process-oriented intensive oceanographic observation projects in the tropical oceans.

Initially, data are collected from radio transmissions, with fully digitized and quality controlled observations added with time. The subsurface thermal data described above are analyzed, and the Centre assembles and disseminates quality-controlled Level II-B data sets for the Global Oceans. The Centre is also re-



sponsible for provision of these data sets to the World Data Centers, Oceanography at appropriate intervals.

WDC-A, by virtue of its collocation with the U.S. National Oceanographic Data Center (NODC), also has access to the Tropical Pacific Ocean data set jointly maintained by NODC and the Scripps Institution of Oceanography (SIO), serving as the Joint Environmental Data Analysis (JEDA) Center. JEDA tracks, acquires, quality controls, and merges all available subsurface thermal data for the Tropical Pacific. NODC assembles, reformats and initiates quality control of the data; SIO performs further quality control and analysis of the data. Each yearly Level II-B Pacific Ocean data set undergoes the full spectrum of quality control and analysis by the JEDA Center; it is then provided to WDC-A.

### TOGA Sea Level Center

The TOGA Project, realizing the importance of sea level data for research in ocean dynamics and for the monitoring and prediction of oceanographic processes, established a TOGA Sea Level Center at the University of Hawaii. The purpose of this Center to collect all sea level data taken by island-based and coastal tide gauges in the area between 30°N and 30°S during the TOGA project, and to make them available for research. The TOGA Sea Level Center also obtains and archives past sea level data for the same region, when they are made available from the originators. Hourly, daily, and monthly values are prepared and archived, the data are stored digitally and are passed on yearly to other TOGA data centers, to the Permanent Service for Mean Sea Level (PSMSL), and to the World Data Centers, Oceanography; The Archive is maintained online, with access through the World Wide Web and FTP. The TOGA Sea Level Center also supports the Global Sea Level Observing System (GLOSS). Sea level data has assumed greater importance because of its utilization in the calibration of satellite altimeters, such as GEOSAT. Since the conclusion of the TOGA program, many of the observing stations have continued to provide sea level data on a regular basis.

Through the creation of the Joint Archive for Sea Level (JASL) with the University of Hawaii, the U.S. NODC is providing data management for this effort and assisting in the acquisition, processing, quality assurance, archiving, and dissemination of the data. The Joint Archive for Sea Level submits sea level time series data updates to NODC on a yearly basis. These updates may include data from new stations, as well as previously unprocessed data from existing stations. In addition, the updates may include data previously submitted to NODC that have been reprocessed to improve data quality. Therefore, to update the sea level data files for a station already in the database, NODC completely replaces the time series of data for that station with a new version that may include both new and reprocessed data.

### TOGA TAO Array

The TOGA TAO (Tropical Atmosphere Ocean) Array provided measurements of surface winds, air temperature, humidity, SST, upper-ocean temperatures and currents. This mooring array was established by TOGA in the Equatorial Pacific. The array is comprised of the ATLAS (Autonomous Temperature Line Acquisition System) wind and thermistor chain moorings and the PROTEUS (PROfile TElemetry of Upper ocean currentS) downward-looking Acoustic Doppler Current Profiler (ADCP) current measurement system. For the ATLAS moorings, surface winds, air temperature, humidity, SST, and sub-surface temperature at 10 depths down to 500 m are telemetered to shore via Service Argos severral times a day, and for PROTEUS, daily-averaged velocity profiles with 8 m vertical resolution between 10 - 250 m are telemetered to shore in real time via Service Argos. Since the conclusion of the TOGA program, TAO coverage in the tropical oceans has been significantly enhanced.

NODC receives periodic updates to the TAO Array data set; WDC-A provides updates of this data set to its counterpart WDCs.

### WDC-A, Oceanography Support to TOGA

WDC-A, Oceanography serves as an archival center for each of these TOGA Data Sets. Its responsibilities are to provide TOGA data sets to requesters in the international scientific community, at a cost not to exceed that of data reproduction and postage, and to provide copies of all TOGA data sets received to World Data Centers B and D, Oceanography in exchange. TOGA data and information are available from the following Specialized Data Centers:

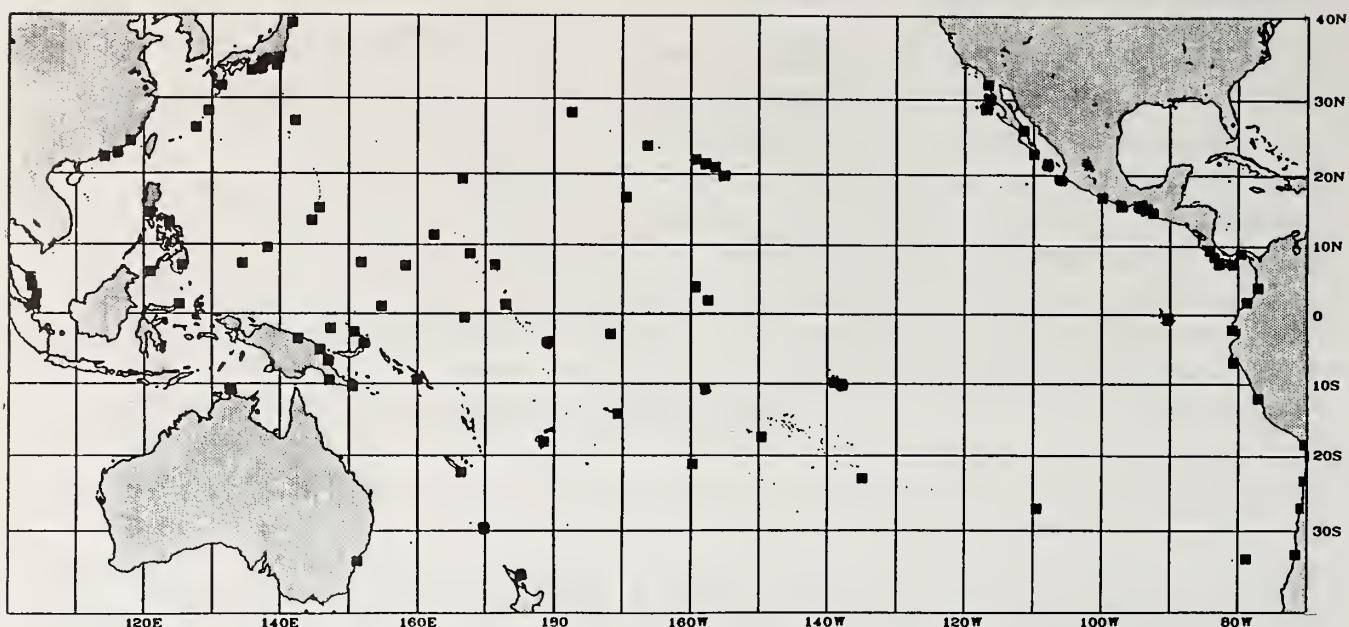
Global Subsurface Data Centre  
Centre IFREMER de Brest  
BP 70  
29263 Plouzane, France  
Email: Marie.Claire.Fabri@ifremer.fr

JEDA Center  
National Oceanographic Data Center  
NOAA  
Silver Spring, MD 20910-3282 U.S.A.  
Email: mhamilton@nodc.noaa.gov

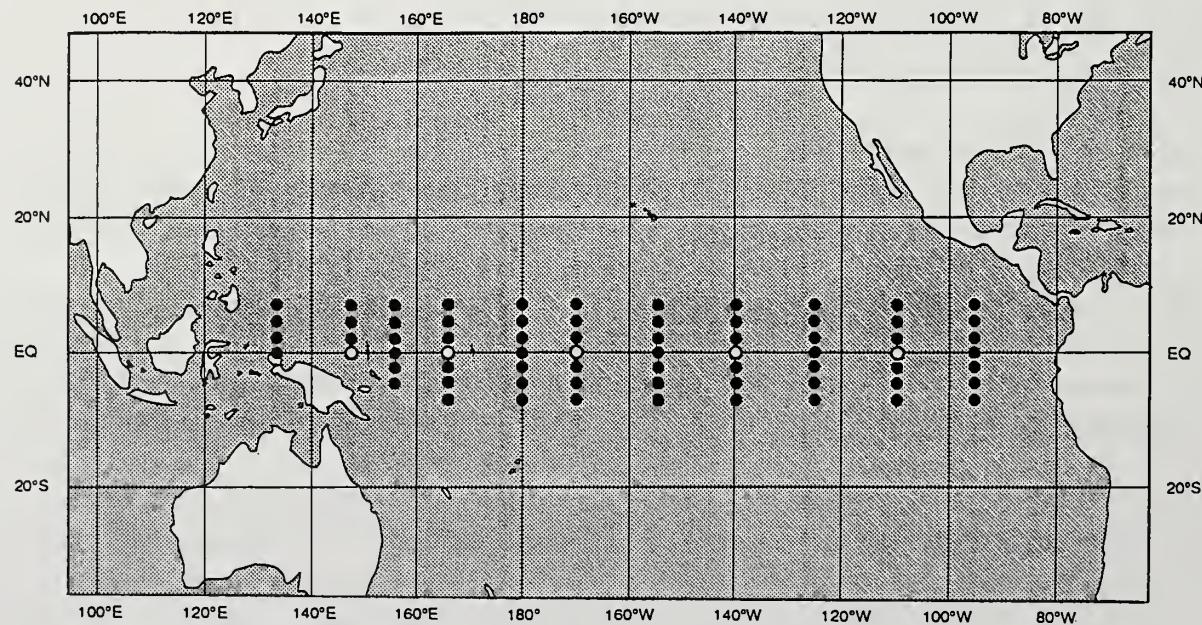
JEDA Center  
Scripps Institution of Oceanography  
University of California  
La Jolla, CA 92093 U.S.A.  
Email: wbwhite@ucsd.edu

The Joint Archive for Sea Level  
University of Hawaii - MSB 312  
1000 Pope Road  
Honolulu, Hawaii 96822 U.S.A.  
Email: caldwell@nodc.noaa.gov

World Data Center A, Oceanography  
National Oceanic & Atmospheric Admin.  
Silver Spring, MD 20910-3282 U.S.A.  
Email: wdca@nodc.noaa.gov



Pacific Ocean sea-level stations with quality-controlled data in the JASL archive



Pacific Ocean TOGA "Tropical Atmosphere Ocean" (TAO) array

# RNODC SOC

## SOUTHERN OCEANS DATA SET

The RNODC/Southern Oceans (RNODC/SOC) was created in order to provide a regional data management and data information service for Southern Oceans physical and chemical oceanographic data. The RNODC was created under guidelines set forth in Recommendation XII.1 by the IOC's Technical Committee on International Oceanographic Data Exchange (IOC XII, Moscow 10-17 December 1986).

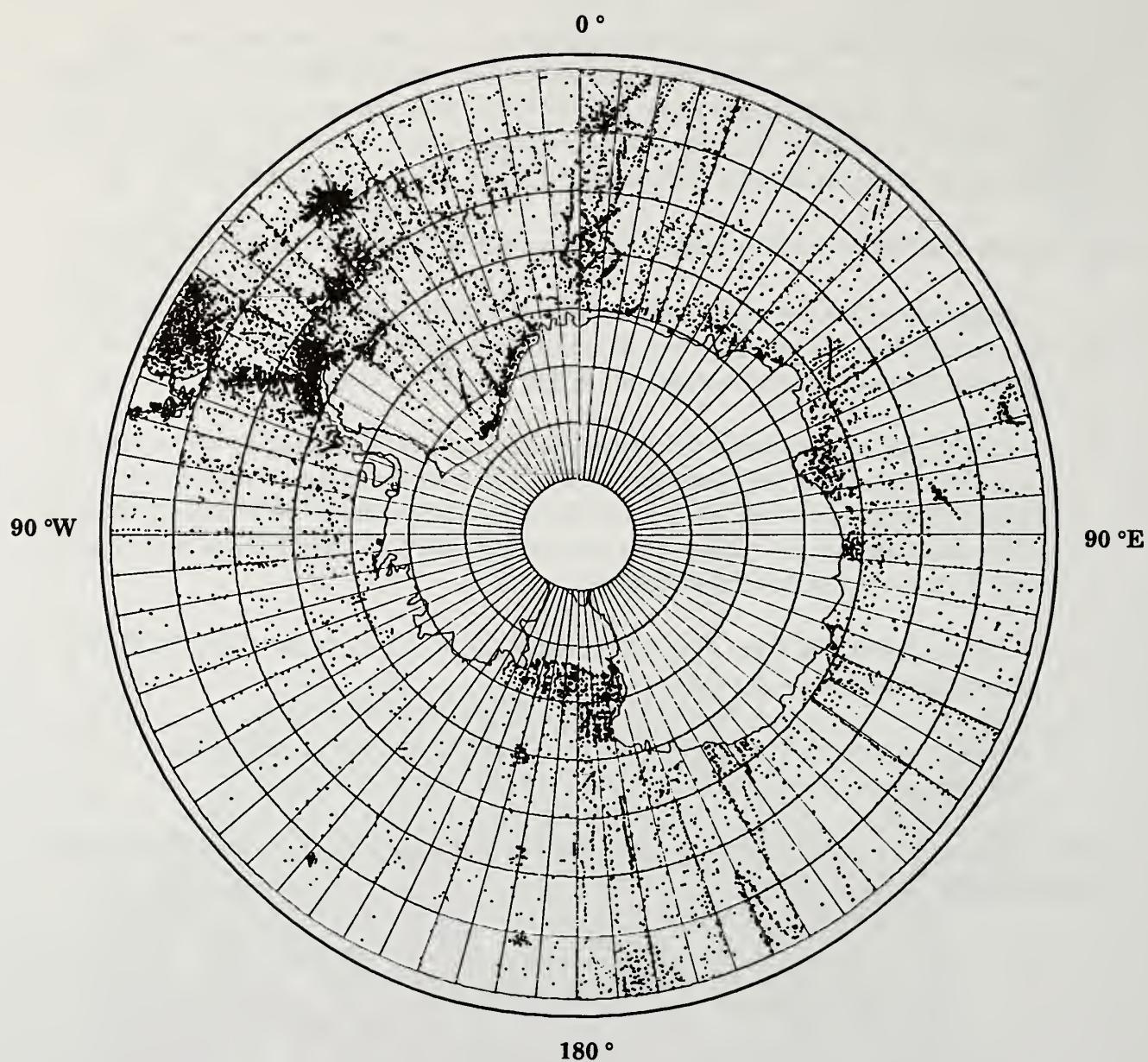
The Terms of Reference of the RNODC/SOC include the following responsibilities:

- Acquire, quality control, and store in standard format the physical and chemical data obtained by the international community from the cruises and research programmes carried out in the Southern Oceans;
- Co-operate closely with the World Data Centers, Oceanography by sending regular shipments (at least once a year), free of charge, of complete sets of physical and chemical data stored on magnetic tapes in GF3, and inventories, data summaries, and other data products related to the physical and chemical data from the Southern Oceans;
- Assist the World Data Centers by sending copies to them of any ROSCOP forms submitted to the RNODC-SOC;
- Co-operate with the BIOMASS Data Center, regarding exchange of data and inventories, as well as other data products.

The RNODC-SOC is located in and operated by the Argentine Oceanographic Data Center (CEADO).



## SOUTHERN OCEANS OCEANOGRAPHIC STATION PLOT



This plot shows the locations of 15,670 oceanographic data observations made in the Southern Oceans and registered in the RNODC/SOC master data file.

## RNODC/SOC Oceanographic Data Set

The RNODC/SOC data set contains data for all available oceanographic stations for the Southern Oceans between 50° and the Antarctic Continent. Data for a total of 15,670 oceanographic stations taken during 387 Southern Oceans cruises are included in the data set. Seasonally, the data totals are approximately 2,500 observations taken during the Austral Winter (April-September) and more than 13,000 observations taken during the Austral Summer (October-March). Southern Oceans observational data taken by 19 countries have been received by the RNODC.

The RNODC/SOC data set is available from:

Argentine Oceanographic Data Center (RNODC/SOC)  
Centro Argentino de Datos Oceanograficos  
Ave. Montes de Oca 2124  
1271 - Buenos Aires  
Republica Argentina

Email: [ceado@rina.hidro.gov.ar](mailto:ceado@rina.hidro.gov.ar)

or

World Data Center A, Oceanography  
National Oceanic & Atmospheric  
Administration  
Silver Spring, MD 20910-3282 U.S.A.

Email: [wdca@nodc.noaa.gov](mailto:wdca@nodc.noaa.gov)

# **RNODEC IGOSS**

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## **INTEGRATED GLOBAL OCEAN SERVICES SYSTEM DATA SET**

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### Background

The Integrated Global Ocean Services System (IGOSS) is a worldwide system for the rapid collection, exchange and analysis of oceanographic data and the timely preparation and dissemination of ocean products and services. IGOSS was established to support oceanographic and meteorological research efforts by providing: (1) a global distribution of oceanographic observations, (2) a mechanism for the timely and effective exchange of data, and (3) the preparation of oceanographic analysis products capable of supporting global change and climate research studies. IGOSS products and services can be useful for input to large scale circulation models, for research survey planning, and for direct application in commercial fisheries, recreation, commercial shipping, and search and rescue efforts. Real-time ocean products currently available include sea surface and subsurface temperature analyses and graphical depictions of mixed layer depths and ocean frontal positions. Additional analyses and data summaries available as delayed-mode products include: (1) ocean currents, (2) salinity, (3) distribution of pollutants, and (4) weekly and monthly temperature means. The IGOSS data are BATHY (profiles of temperature with depth) and TESAC (temperature/salinity/current profiles with depth).

The major operational elements of the IGOSS program are: (1) observing system, (2) data processing and services system, (3) telecommunication arrangements, (4) marine pollution monitoring, and (5) data archival and exchange. The organizational structure of the IGOSS data processing and services system consists of World Oceanographic Centers in Moscow and Washington and National and Specialized Oceanographic Centers in participating nations. Data from all cooperating nations are combined in standard formats at the World Oceanographic Centers, and then used as input to global and hemispheric analyses for improved weather forecasting, global climate studies, and a variety of products for oceanographic research uses. National Oceanographic Centers provide quality control for data from their country entering the international exchange system via a high speed global telecommunications link called the Global Telecommunication System (GTS) of the World Weather Watch.



Long-range data exchange and service arrangements and long-term archival activities for IGOSS data are performed by National Oceanographic Data Centers in Japan, the U.S.S.R., and the United States. These NODC's, serving as Responsible National Oceanographic Data Centers (RNODC's) for IGOSS, compile archives of IGOSS data and products, assume responsibilities for specified regions of the world oceans, and deal with problems of quality control. They maintain geographically sorted, updated files of observations received via the GTS.

#### RNODC's/IGOSS Terms of Reference

The terms of reference for RNODC's/IGOSS are as follows:

1. Acquire BATHY and TESAC datasets and sub-surface temperature data from drifting and moored buoys from IGOSS Specialized Oceanographic Centres (SOC) for area of responsibility; apply supplementary quality control to acquired data and provide services to users after 30 days from receipt of that data;
2. Acquire non-operational BATHY, TESAC, and sub-surface temperature data from drifting and moored buoys and/or datasets for area of responsibility; apply quality control on non-operational data, prepare integrated datasets, and provide services to users;
3. Maintain a data base and inventories for areas of responsibility;
4. Prepare products based on operational and non-operational IGOSS data, as appropriate; also, archive and make available to users, selected data products provided by SOCs and analysis centres;
5. Provide for exchange of IGOSS data with other RNODC's or to other users as requested;
6. Transmit datasets, inventories of archived data, and selected data products to the WDCs annually;
7. Provide for exchange of documentation and software regarding quality control and processing procedures, with other RNODC's, as possible;
8. Participate in efforts to monitor data flow, and participate, as feasible, in IOC training programmes;
9. Prepare inventories of available data sets of the RNODC's area of interest and transmit them to the IOC Secretariat semiannually.

### RNODC/IGOSS - Japan

The RNODC/IGOSS-Japan is operated by the Japan Oceanographic Data Center (JODC), with support from the Japan Meteorological Agency (JMA), which serves as a Specialized Oceanographic Center (SOC) for IGOSS. At the SOC, systematic quality control of the collected BATHY/TESAC reports is made. The SOC compiles the IGOSS monthly summaries including maps showing the geographical distribution of BATHY/TESAC messages and numbers of messages of individual ships and sends them to the Secretariat of the IOC.

IGOSS data submitted by the SOC are stored in three formats at the RNODC/IGOSS. The first includes the original data file compiled on a semiannual basis. This file contains the collected and processed data from the GTS and other operational sources within the area of responsibility. The second contains the data and data inventory files recorded in a form of the SYNDARC Format, and is available to users as computer-generated data summaries, statistical presentations, and graphical plots, or in a medium which allows the user to further process the data using a personal computer. During the conversion process, minimum quality control procedures are applied to the original data based on IOC Manuals and Guides No. 3. The third is the JODC-formatted version of the data inventory file. From this file, data products such as data summaries and location plots of observations are provided to users, as well as to the IOC and WMO.

### RNODC/IGOSS - Russia

The RNODC/IGOSS-Russia and SOC for IGOSS data was established in 1984 under the auspices of the Russian Scientific Research Center for Hydrometeorological Information and the Russian Hydrometeorological Scientific Research Center (Russian Hydrometcenter). The responsibilities of the RNODC/IGOSS include the collection of BATHY/TESAC messages and logs, quality control of the data, preparation of data sets on magnetic tape, and the development of products concerning availability and time-space data distribution. The RNODC/IGOSS also provides national and international users with copies of data, results of analyses, and with other products for its area of responsibility.

The responsibilities of the SOC include preparation, publication, and distribution of different types of operational oceanographic products on a regular basis including those distributed via FAX machines that are readily available to different groups of users.

These activities are carried out in accordance with the procedures spelled out in the IOC's Guide to Operational Procedures for the Collection and Exchange of Oceanographic Data (BATHY and TESAC), 1985 and the Guide to the IGOSS Data Processing and Services System, 1983.

### RNODC/IGOSS - U.S.

The RNODC/IGOSS-U.S., located at the National Oceanographic Data Center (NODC), receives near real-time data weekly from the Ocean Products Center at Suitland, Maryland and the Ocean Applications Group in Monterey, California. These data are extracted from the Global Telecommunications System (GTS) on a daily basis for screening and editing. At the RNODC, the near real-time data sent by the two organizations are run through a series of programs to convert the data into NODC's Universal Bathythermograph (UBT) format. This data set is next sorted by date, time, position, and an indicator of the source of the data. The sorted file is then compared with existing observations and duplicates are eliminated.

The records retained are then sorted by reference number, date, and time to produce a cruise-ordered data set. From this final data set, inventory records are created. These data are then merged into the RNODC/IGOSS Archive. The Archive is updated on a monthly basis in geographical sequence.

Data in the U.S. RNODC/IGOSS Archive are then available for international exchange and can be provided to users in a variety of forms ranging from standard media copies to computer-generated data summaries, statistical analyses, and graphic plots.

### Availability of IGOSS Data and Products through WDC-A, Oceanography

Various RNODC/IGOSS data, analyses, and products are available through WDC-A, Oceanography. Upon request, WDC-A will provide copies of pertinent data products, or, alternatively, refer the requester to the appropriate IGOSS data source.

# GTSPP

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## GLOBAL TEMPERATURE - SALINITY PROJECT

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### INTRODUCTION

Making ocean temperature and salinity data quickly and easily accessible to users is the primary goal of the Global Temperature - Salinity Program (GTSPP). A cooperative international program, the GTSPP has now developed a global ocean T-S data base comprised of data that are as up-to-date and of the highest quality possible. Numerous IODE countries are now contributing to the program.

### U.S. PARTICIPATION

The U.S. supports the GTSPP through the participation of its National Oceanographic Data Center (NODC). NODC fulfills several functions in support of the GTSPP:

- 1. Data communications support.** The Internet is used daily to transmit and receive data and project information. Real-time data are relayed from NOAA's National Weather Service and the Navy's Fleet Numerical Oceanography Center to Canada's Marine Environmental Data Service (MEDS). In addition, monthly fliers are transmitted to oceanography centers in Hobart, Australia; Brest, France; La Jolla, California; Miami, Florida; and other locations in the United States.
- 2. Data quality control.** All GTSPP data are passed through standard data quality tests, which are documented in the GTSPP Real-Time Quality Control Manual (Intergovernmental Oceanographic Commission Manuals and Guides No. 22, UNESCO, 1990). NODC has implemented two systems to apply quality tests to data destined for the GTSPP database. The systems operate on UNIX-based workstations that are part of NODC's client/server computing environment. One system displays geographical positions of observations as compared to land masses, and shows ship speed between observations as a check on positions dates and times. The second system applies tests to subsurface temperature and salinity data, setting flags to reflect test results.
- 3. Database maintenance.** GTSPP data are maintained in a relational database that is managed by commercial software on the UNIX workstation. Real-time data are added automatically, as they arrive from MEDS. Higher quality delayed mode data are also being quality controlled and added to the data base. As these observations are added, the matching real-time data are tagged to avoid sending two copies of the same data. The database makes it possible to quickly load and retrieve data,

as well as to provide statistics about the number of observations per geographic region, time period, ship, or data type.

## **GTSPP DATA**

Data in the GTSPP database are generated by ships or buoys from all regions of the world's oceans. Instruments used to collect the data include thermistor chains (on buoys), XBTs, digital bathythermographs (DBTs), bottle samplers, and CTDs. The data are sent in real-time (by radio or satellite transmission) and later in delayed mode when ships return to port.

Delayed-mode records are generally of higher resolution than records sent in real time. Therefore, NODC acquires delayed mode data (usually several months after data were collected) and merges them into the database. To avoid duplication of real-time and delayed mode observations, real-time records are matched to corresponding delayed mode records in the database. In that way, the GTSPP data resource is built quickly from real-time records and subsequently enhanced by high quality, high resolution delayed mode records.

## **SUPPORT TO CLIMATE RESEARCH**

NODC continues to provide monthly files of real-time data to WOCE Upper Ocean Thermal science centers in France, Australia, and the U.S.; each of these centers uses the data in ocean climate research. Results of their scientific analyses are fed back into the GTSPP database to enhance data quality. Also, in support of WOCE, NODC now produces reports of the distribution of data along TOGA-WOCE-IGOSS transect lines.

GTSPP has demonstrated the feasibility of a global ocean network of data management and science centers. The project has shown that computer technology and networks, now in place, are sufficient for sustaining cooperative work such as that being done in GTSPP. Experience gained from GTSPP will be useful to future global ocean data management projects, such as the Global Ocean Observing System (GOOS).

To obtain information about the availability of data from the GTSPP Data Base, as well as participation in the Program itself, please contact the following:

National Oceanographic Data Center  
NOAA/NESDIS E/OC13  
Silver Spring, MD 20910-3282 U.S.A.

Email: [mhamilton@nodc.noaa.gov](mailto:mhamilton@nodc.noaa.gov)

World Data Center A, Oceanography  
NOAA  
Silver Spring, MD 20910-3282 U.S.A.

Email: [wdca@nodc.noaa.gov](mailto:wdca@nodc.noaa.gov)

# **ROSCOP**

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## **REPORT OF OBSERVATIONS/SAMPLES COLLECTED BY OCEANOGRAPHIC PROGRAMS**

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International marine data inventories, particularly the Reports of Observations/Samples Collected by Oceanographic Programs (ROSCOPs 1 and 2) and their successor, the Cruise Summary Report (ROSCOP 3), have played a significant role in the success of IODE data exchange and data management for more than 20 years. In addition to their stated purpose of providing a means for determining the availability of internationally exchangeable data in advance of its actual receipt, these inventories have also: (1) provided referral service to data not routinely exchanged through the WDC system and (2) supplied important documentation in support of processing by national and regional data centers.

The ROSCOP scheme was initially approved by IODE at its Fifth Session in 1970 as an interim marine data inventory, and the first ROSCOP 1 forms were received by WDC-A in 1971. A completely revised version (ROSCOP 2) was developed by the Task Team on Inventories of Marine Data and Samples, and was accepted by IODE at its Seventh Session in 1973; ROSCOP 2 forms were first received during 1974. Subsequently, in consideration of new requirements identified by IODE, the form was completely redesigned in 1989; the resulting Cruise Summary Report (also subtitled ROSCOP 3 for purposes of continuity), which was intended to be more user-friendly, was approved by IODE in 1990.

Through the end of 1998, WDC-A had received and tabulated a total of 23,456 ROSCOP forms of all types (ROSCOPs 1, 2 and 3) for the twenty-year period. A general decline in numbers of forms received from the first half of the period to the last half is evident. Certain factors have obviously had a significant impact on the receipt of ROSCOP forms: (1) the occurrence of special projects of limited duration (such as the U.S. OCSEAP Program in the 1970s) that generated large numbers of ROSCOPs; (2) a possible overall decrease in many countries' national marine science programs; and (3) significant periods of policy changes or disruptions that impact a Data Center's activities.

In evaluating the long-term success of the ROSCOP program, it is important to recognize the valuable contribution made by ICES in developing the automated system that facilitates utilization of information received on the ROSCOP forms. The automated ICES system is in use at WDC-A. Previous discrepancies between WDC-A's ROSCOP tabulations and the ICES system have recently been resolved. A WDC-A project has now ensured that all of WDC-A's historical ROSCOPs have been provided to ICES.

Number of ROSCOP forms and Cruise Summary Report forms received by  
WDC-A, Oceanography, as of 31 December 1998

Country	ROSCOP 1 Forms	ROSCOP 2 Forms	Cruise Summary Reports
Argentina	1	158	19
Australia	--	89	--
Belgium	15	13	--
Brazil	--	106	21
Canada	63	315	38
Chile	--	1	--
Colombia	9	--	--
Denmark	41	223	--
Ecuador	6	--	--
Finland	27	107	--
France	100	2,335	615
Germany	513	1,746	1,661
Ghana	--	2	--
Iceland	39	122	--
India	32	8	--
Indonesia	--	--	2
Ireland	12	43	--
Italy	3	--	--
Japan	214	1,638	212
Netherlands	78	295	11
Norway	108	404	--
Peru	3	--	--
Poland	82	100	--
Portugal	--	1	--
Spain	35	15	--
Sweden	38	203	--
South Africa	--	477	--
Russia	85	393	--
United Kingdom	614	2,412	514
United States	20	6,304	301
Korea (Republic of)	8	58	328
Congo (People's Rep.)	16	1	--
Senegal	1	--	--
Mauritania	2	--	--
<b>Totals</b>	<b>2,165</b>	<b>17,569</b>	<b>3,722</b>

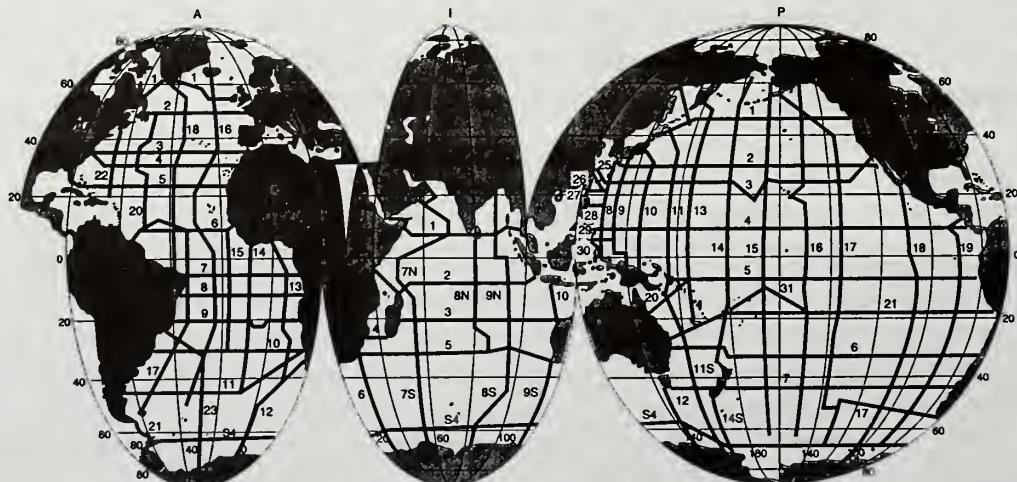
## WORLD OCEAN CIRCULATION EXPERIMENT

### BACKGROUND

The World Ocean Circulation Experiment (WOCE) is a component of the World Climate Research Program that seeks to investigate the role played by ocean circulation in the earth's climate system. Its goal is to develop improved ocean circulation models for use in climate prediction. The WOCE observational phase (1990-1997) has used satellites and in-situ physical/ chemical measurements taken during this largest and most comprehensive ocean observational program undertaken to date, in compiling a quasi-synoptic data set of unprecedented scope.

### DATA MANAGEMENT

The WOCE Hydrographic Program (WHP) is comprised of One-Time Surveys, Repeat Hydrography, and Bathymetry data taken along WOCE tracks. The One-Time Survey encompasses a range of physical and chemical measurements at discrete stations and from continuous sampling. Repeat Hydrography sections and time-series stations provide information on the temporal variability of the ocean in different seasons and years. The WHP Special Analysis Center represents the final stage in the hydrographic data management process, providing a globally-consistent data set and generating dynamical data products. Direct Current Measurements include data from Current Meter Moorings, Subsurface Floats, Surface Drifting Buoys, and Acoustic Doppler Current Profilers (ADCPs). WOCE Upper Ocean and Sea Surface Observations consist of Upper Ocean Thermal Data, Sea Surface Salinity, and Surface Meteorological Data and Surface Fluxes. Upper Ocean Thermal measurements are taken with XBTs, moored buoys, thermistor chains, profiling floats, and CTDs.



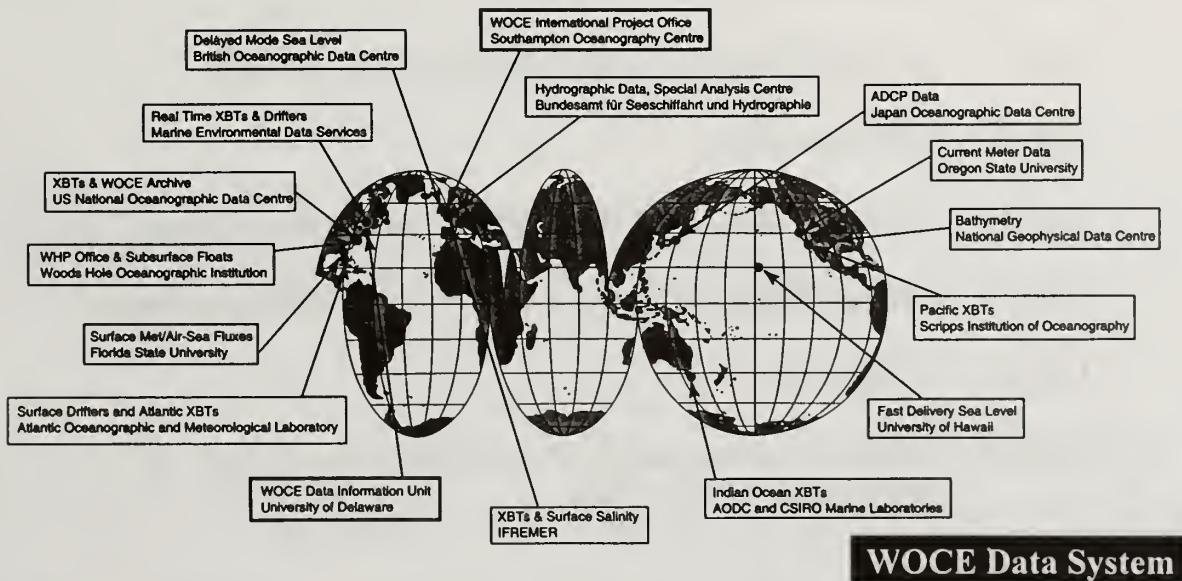
*The WOCE One-Time Hydrographic Survey*

The unusually wide variety of data types observed during WOCE has required a somewhat different approach to data management than was employed during previous international ocean surveys. The WOCE data management structure consists of the following elements:

**Data Assembly Centers (DACs)** are managed by scientists, handle assembly and quality control of data sets, and generate data products.

**Special Analysis Centers (SACs)** perform data analysis and synthesis functions, including the generation of derived data sets.

**Data Information Unit (DIU)** is a central source of information on the status of WOCE, tracking all data collection, processing, and archiving activities, and acting as the primary interface between the WOCE data system and its users.



## WOCE DATA AVAILABILITY

Resources and expertise from almost 30 countries have been combined to produce an unprecedented collection of in-situ and satellite observations of the global oceans for the period 1990-1997. The Global Data Version 1.0 CD-ROM Series, which was the inaugural set of WOCE CD-ROMs, was released at the May 1998 WOCE Ocean Circulation and Climate Conference in Halifax, Canada. This series, prepared by

the U.S. NODC, makes available a unique and diverse set of data that can be expected to provide invaluable assistance to climate researchers. The 13 CDs cover all facets of the WOCE field program:

Disc 1 - The Data Information Unit and Bathymetry Data

Disc 2 - Hydrographic Program Data

Disc 3 - Hydrographic Program Data Products

Disc 4 - Upper Ocean Thermal Data

Disc 5 - Subsurface Floats Data

Disc 6 - Surface Velocity Program Data

Disc 7 - Current Meter Moorings Data

Disc 8 - Acoustic Doppler Current Profilers (ADCP) Data

Disc 9 - Sea Level Data

Disc 10 - Surface Meteorology Data, Pacific and Indian Oceans

Disc 11 - Surface Meteorology Data, Atlantic and Southern Oceans

Disc 12 - Surface Fluxes

Disc 13 - Satellite Derived Sea Surface Temperature (SST) and Sea Surface Height Data

Versions 1.5 and 2.0 of the WOCE CD-ROM Series are expected to be issued at appropriate intervals, as additional WOCE data sets are received from WOCE PIs. The WOCE CD-ROMs are available upon request from WDC-A, Oceanography and the U.S. NODC.

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